

## SSC Selection Post (Graduation) Similar Paper (Held on 29 Jul 2025 S3)

**Q.1** Each question has four options. Three of them follow a common pattern or rule. One option does not follow that rule. Identify the odd one out.

- A. 18 – 3
- B. 25 – 4
- C. 32 – 5
- D. 45 – 6

**Answer:** C

**Sol: Information Given:** Pairs: (18,3), (25,4), (32,5), (45,6)

**Logic:** Compare first number with the square of the second number.

**Explanation:** Logic: First number = (second number)<sup>2</sup> + constant.

(a)  $3^2 = 9 \rightarrow 18 - 9 = 9$

(b)  $4^2 = 16 \rightarrow 25 - 16 = 9$

(c)  $5^2 = 25 \rightarrow 32 - 25 = 7$  ✗

(d)  $6^2 = 36 \rightarrow 45 - 36 = 9$

Only option (c) does not follow the same rule.

**Final Answer:** 32 – 5

**Final Correct Option:** (c)

**Q.2** A conclusion or inference is to be drawn from the given statement. Choose the option that most strongly supports it.

**Sociologist:** "Rapid urbanization without adequate infrastructure increases living difficulties."

Which of the following statements, if true, best supports this view?

- A. Many cities generate higher revenue after urban expansion.
- B. Urban areas attract skilled workers and industries.
- C. Cities with fast population growth face shortages of housing and sanitation.
- D. Rural regions experience slower economic growth.

**Answer:** C

**Sol: Information Given:** Statement: Rapid urbanization without adequate infrastructure increases living difficulties. Task: Choose the statement that best supports this view.

**Logic:** Support must show urban growth causing problems due to lack of facilities.

**Explanation:** Logic: Direct evidence of difficulties from rapid urban population growth.

(a) Revenue increase → does not show difficulty

(b) Skilled workers attraction → positive effect

(c) Housing and sanitation shortages → direct living difficulties ✓

(d) Rural growth → unrelated

**Final Answer:** Cities with fast population growth face shortages of housing and sanitation.

**Final Correct Option:** (c)

**Q.3** In a family:

P is the father of Q. Q is the brother of R. R is the mother of S. T is the wife of P

How is T related to Q?

- A. Aunt

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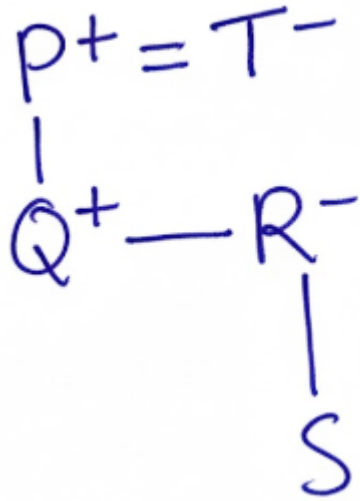


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- B. Mother
- C. Sister
- D. Grandmother

**Answer:** B

**Sol: Information Given:** P is father of Q Q is brother of R R is mother of S T is wife of P



Final Answer: T is the mother of Q  
**Final Correct Option:** (b)

**Q.4** In the following question, select the word that is related to the given pair in the same manner.  
Erosion : Weathering :: Disease : ?

- A. Infection
- B. Nutrition
- C. Immunity
- D. Recovery

**Answer:** A

**Sol: Information Given:** Analogy: Erosion : Weathering :: Disease : ?

**Logic:** Identify the relationship between the first pair.

**Explanation:** Logic: Second term is the cause/process of the first. Weathering → causes erosion Infection → causes disease

Check options:

(a) Infection ✓ cause

(b) Nutrition X prevention

(c) Immunity X protection

(d) Recovery X result

**Final Answer:** Infection

**Final Correct Option:** (a)

**Q.5** In this question, four versions of an office address are provided. Exactly two of them are completely identical. Identify those two and choose the correct option.

1. Surat Circle Second floor within premises Regional Post Office Ring Road Surat – 395002
2. Surat Circle Second floor within premises Regional Post Office Ring Road Surat – 395002
3. Surat Circle Second Floor within premises Regional Post Office Ring Road Surat – 395021
4. Surat Circle Second floor within campus Regional Post Office Ring Road Surat – 395002

- A. 1 and 2
- B. 2 and 3
- C. 3 and 4
- D. 1 and 4

**Answer:** A

**Sol: Information Given:**

Four versions of an office address are given. Task: Find exactly two addresses that are completely identical (word-for-word).

**Logic:** Addresses must match in spelling, capitalization, wording, and PIN code.

**Explanation:** Logic: Compare each line character-by-character.

1 and 2 → Completely identical (same words, same capitalization, same PIN).

3 → "Second Floor" (capital F) and PIN 395021 (different).

4 → Uses "within campus" instead of "within premises" (different).

**Short Trick:** Check line-by-line: Floor case, premises/campus, and PIN code first.

**Final Answer:** Addresses 1 and 2 are identical.

**Final Correct Option:** (a)

**Q.6** What should come at the place of question mark (?) in the following series?

3, 4, 13, 14, 43, 44, 133, ?

- A. 134
- B. 132
- C. 135
- D. 144

**Answer:** A

**Sol: Information Given:** Series: 3, 4, 13, 14, 43, 44, 133, ?

**Logic:** Pattern alternates between  $+1$  and  $\times 3 + 1$ .

**Explanation:** Logic:  $\times 3 + 1$ , then  $+1$  alternately.

Step-by-step:  $3 \rightarrow 4 (+1)$

$4 \rightarrow 13 (4 \times 3 + 1)$

$13 \rightarrow 14 (+1)$

$14 \rightarrow 43 (14 \times 3 + 1)$

$43 \rightarrow 44 (+1)$

$44 \rightarrow 133 (44 \times 3 + 1)$

$133 \rightarrow 134 (+1)$

**Final Answer:** 134

**Final Correct Option:** (a)

**Q.7** A data storage system follows an LSM-tree structure consisting of 4 levels. If level 0 can store 50 records and each higher level can store 8 times the records of the previous level, what is the total storage capacity of the system?

- A. 29,250
- B. 29,450
- C. 30,000
- D. 28,800

**Answer:** A

**Sol: Information Given:** LSM-tree with 4 levels (Level 0 to Level 3) Level 0 capacity = 50 records Each higher level stores 8 times the previous level

**Formula Used:** Geometric progression sum

**Explanation:** Logic: Each level = previous  $\times$  8; add all levels.

**Level 0** = 50

**Level 1** =  $50 \times 8 = 400$

**Level 2** =  $400 \times 8 = 3,200$

**Level 3** =  $3,200 \times 8 = 25,600$

Total =  $50 + 400 + 3,200 + 25,600 = 29,250$

**Short Trick:** 4-level LSM  $\rightarrow$  add GP terms:  $a(1 + r + r^2 + r^3)$

**Final Answer:** 29,250

**Final Correct Option:** (a)

**Q.8** In the following question, choose the number that will replace the question mark (?) to complete the analogy:

5 : 60 :: 6 : ?

- A. 84
- B. 88
- C. 90
- D. 96

**Answer:** A

**Sol: Information Given:** Analogy: 5 : 60 :: 6 : ?

**Logic:** Find the operation connecting 5 to 60, then apply it to 6.

**Explanation:** Logic:  $n \times (n + 1) \times 2$

$5 \times 6 \times 2 = 60$

$6 \times 7 \times 2 = 84$

**Final Answer:** 84

**Final Correct Option:** (a)

**Q.9** Carefully observe the letters in the word **DEMOCRATIC**. From the options given below, choose the word that can be formed using the letters of the given word, without repeating any letter more than its available frequency.

- A. COMRADE
- B. ACADEMIC
- C. CANDIDATE
- D. DIRECTOR

**Answer:** A

**Sol: Information Given:** Word: DEMOCRATIC Task: Form a word using available letters without exceeding frequency.

**Logic:** Check letter availability and repetition.

**Explanation:** Logic: Compare letters of each option with DEMOCRATIC.

Letters in DEMOCRATIC: D, E, M, O, C, R, A, T, I

(a) COMRADE C, O, M, R, A, D, E  $\rightarrow$  all available  $\checkmark$

(b) ACADEMIC Needs A  $\times 2$  and C  $\times 2 \rightarrow$  only one A and one C  $\times$

(c) CANDIDATE Needs N  $\times 1$ , D  $\times 2$ , A  $\times 2 \rightarrow$  N missing, repeats  $\times$

(d) DIRECTOR Needs R  $\times 2 \rightarrow$  only one R  $\times$

**Final Answer:** COMRADE

**Final Correct Option:** (a)

**Q.10** In a coded language, the word **PREDICTION** is written as **NOITCIDERP**. Using the same coding pattern, what will be the code for **EXPLANATION**?

- A. NOITANALPXE
- B. NOITALPXEAN
- C. NOITALPXENA
- D. NOITALPANEX

**Answer:** A

**Sol: Information Given:** Coding: PREDICTION → NOITCIDERP  
Word to code: EXPLANATION

**Explanation:** Logic: Reverse the entire word letter by letter.

EXPLANATION → NOITANALPXE

**Final Answer:** NOITALPANXE

**Final Correct Option:** (a)

**Q.11** Certain numerical operations are defined below. Choose the option that gives the correct result.

If  $X = 4$ ,  $Y = 5$ , and  $Z = 3$ , what is the value of  $(50 \text{ mode } (X + Y) \times Z)$ ?

- A. 21
- B. 27
- C. 18
- D. 23

**Answer:** D

**Sol: Information Given:**  $X = 4$ ,  $Y = 5$ ,  $Z = 3$   
Expression:  $50 \text{ mod } ((X + Y) \times Z)$  (Assumption: mod applies to the whole product)

**Explanation:** Logic: Solve bracket → multiply → apply mod.

Step-by-step:  $X + Y = 4 + 5 = 9$

$9 \times 3 = 27$

$50 \text{ mod } 27 = \text{divide } 50 \text{ by } 27, \text{ remainder} = 23$

**Final Answer:** 23

**Final Correct Option:** (d)

**Q.12 Statement:** A manufacturing firm is considering shutting down units that have been running at a loss for several years. The move could impact many workers and the local economy. Unit heads believe productivity will improve, but audit reports indicate repeated financial decline. Senior management is unsure how to proceed.

What approach should be adopted to take this decision?

- A. immediately shut down all loss-making units to cut expenses
- B. continue operating all units to avoid social and employment issues
- C. set measurable performance benchmarks with a review period and assess each unit objectively
- D. allow individual unit heads to independently decide closure

**Answer:** C

**Sol: Information Given:** Loss-making manufacturing units for several years Social and economic impact involved Conflicting views: unit heads optimistic, audits show decline Management unsure

**Logic:** Best decision balances objectivity, data, and social impact.

**Explanation:** Logic: Avoid extreme or biased decisions; use evidence-based review.

(a) Immediate shutdown → rash, ignores impact

(b) Continue all units → ignores financial reality

(c) Set benchmarks + review → balanced, objective, data-driven ✓

(d) Unit heads decide → biased, inconsistent

**Final Answer:** Set measurable performance benchmarks with a review period and assess each unit objectively.

**Final Correct Option:** (c)

**Q.13** In this question, a situation is described followed by two judgements. Decide which judgement(s) logically follow(s) from the statement.

**Statement:** A company has introduced biometric access cards for all employees.

**Judgement I:** This system will completely eliminate workplace misconduct. Judgement

**II:** This may lead to concerns regarding data security.

- A. only judgement i follows
- B. only judgement ii follows
- C. both judgements i and ii follow
- D. neither judgement i nor ii follows

**Answer:** B

**Sol: Information Given:** Statement: A company has introduced biometric access cards for all employees.

**Logic:** Judgements must be **definitely true**, not assumptions or exaggerations.

**Explanation:** Logic: Check certainty vs possibility.

**Judgement I:** "Completely eliminate workplace misconduct" → ✗ Too extreme; no system guarantees total elimination.

**Judgement II:** "May lead to concerns regarding data security" → ✓ Logical possibility with biometric data.

**Final Answer:** Only Judgement II follows.

**Final Correct Option:** (b)

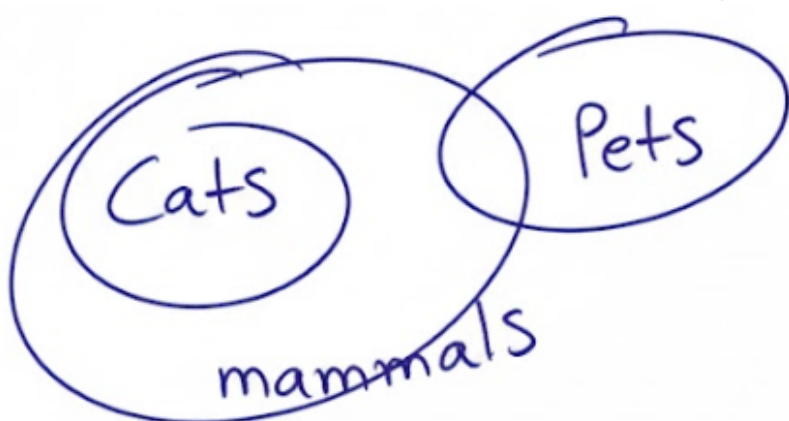
**Q.14** In this type of problem, certain conditions are given and you must identify the statement that is definitely true.

If ALL CATS ARE MAMMALS and SOME MAMMALS ARE PETS, which of the following conclusions must be true?

- A. some cats are pets
- B. some mammals are cats
- C. all pets are cats
- D. no cat is a pet

**Answer:** B

**Sol: Information Given:** All cats are mammals. Some mammals are pets.



- (a) **Some cats are pets** → ❌ *Not definite* Reason: We only know *some mammals* are pets. Cats are mammals, but it is not given that those "some mammals" include cats.
- (b) **Some mammals are cats** → ✅ *Definitely true* Reason: From "All cats are mammals", cats exist within mammals. Hence, at least some mammals are cats.
- (c) **All pets are cats** → ❌ *False* Reason: No statement links all pets exclusively to cats.
- (d) **No cat is a pet** → ❌ *Not definite* Reason: There is no statement denying a relationship between cats and pets. Cats *may or may not* be pets.
- Final Answer: Some mammals are cats  
Final Correct Option: (b)

**Q.15** In the following question, a situation is described. Choose the most appropriate and socially intelligent course of action.

You are part of a project group where one colleague regularly presents shared ideas as solely their own. This has begun to lower team morale. The person does not appear malicious and seems unaware of the impact. You are not the team leader, but others expect you to act. What should you do?

- A. confront the colleague openly during a group discussion
- B. speak to the colleague privately and explain the effect of taking sole credit on team trust
- C. immediately escalate the matter to senior management
- D. ignore the situation to avoid conflict

**Answer:** B

**Sol: Information Given:** Situation: A colleague takes sole credit for shared ideas, unintentionally affecting team morale. You are not the leader but expected to act.

**Logic:** Best response should be calm, corrective, and preserve team harmony.

**Explanation:** Logic: Address the issue directly but privately to avoid embarrassment or conflict.

- (a) Open confrontation → may escalate tension
- (b) Private discussion explaining impact → constructive and socially intelligent ✓
- (c) Escalate immediately → too harsh for a non-malicious issue
- (d) Ignore → morale will worsen

**Final Answer:** Speak to the colleague privately and explain the effect of taking sole credit on team trust.

**Final Correct Option:** (b)



**Q.16** Some mathematical symbols are defined with specific rules. Check which option gives the correct result.

If  $X \star Y = (X \times Y) - (X + Y)$ , what is the value of  $5 \star 4$ ?

- A. 11
- B. 9
- C. 10
- D. 12

**Answer:** A

**Sol: Information Given:** Operation defined:  $X \star Y = (X \times Y) - (X + Y)$  Given:  $X = 5, Y = 4$

**Explanation:** Logic: Multiply first, then subtract the sum.

Step-by-step:  $X \times Y = 5 \times 4 = 20$

$$X + Y = 5 + 4 = 9$$

$$(X \times Y) - (X + Y) = 20 - 9 = 11$$

**Final Answer:** 11

**Final Correct Option:** (a)

**Q.17** Find the appropriate sequence that logically arranges the given administrative units from the smallest to the largest level.  
Village Council, Sub-division, Region, Province

- A. village council, sub-division, region, province
- B. province, region, sub-division, village council
- C. sub-division, village council, province, region
- D. region, village council, sub-division, province

**Answer:** A

**Sol: Information Given:** Administrative units: Village Council, Sub-division, Region, Province

**Task:** Arrange from smallest to largest.

**Logic:** Administrative hierarchy increases from local to broader governance.

**Explanation:** Logic: Smallest local body → largest administrative unit.

Village Council → Sub-division → Region → Province

Check options: (a) Correct order ✓

(b) Reverse order ✗

(c) Incorrect middle order ✗

(d) Incorrect starting unit ✗

**Final Answer:** Village council, sub-division, region, province

**Final Correct Option:** (a)

**Q.18 Statement:** An organization has implemented remote working options for its staff.

**Conclusions:** I. The organization aims to enhance employee well-being.

II. Employees were unable to perform effectively in office-based roles.

- A. only i follows
- B. only ii follows
- C. both follow
- D. neither follows

**Answer:** D

**Sol: Information Given:** Statement: An organization has implemented remote working options for its staff.

**Logic:** Judgements must be **definitely true**, not assumed reasons.

**Explanation:** Logic: Check what necessarily follows from introducing remote work.

**Judgement I:** Enhancing employee well-being → ✗ Possible, but not definite; remote work can be for many reasons.

**Judgement II:** Employees were ineffective in office → ✗ No such indication given.

**Final Answer:** Neither judgement I nor II follows.

**Final Correct Option:** (d)

**Q.19** In each of the following questions, the second word is derived from the first using a specific pattern that may involve alphabet shifting, reversal, or rearrangement. Apply the same pattern to the third word and choose the correct answer.

BRIGHT : ESLHKU :: WINDOW : ?

- A. XJOEPX
- B. XJMOEP
- C. XJOPMX
- D. ZJQERX

**Answer:** D

**Sol: Information Given:** Analogy: BRIGHT : ESLHKU :: WINDOW : ?

**Logic:** Letters are shifted alternately by +3, +1 (left to right).

**Explanation:** Logic: Apply +3, +1 repeatedly to each letter.

BRIGHT → ESLHKU B→E (+3)

R→S (+1)

I→L (+3)

G→H (+1)

H→K (+3)

T→U (+1)

Apply the same to

WINDOW: W→Z (+3)

I→J (+1)

N→Q (+3)

D→E (+1)

O→R (+3)

W→X (+1)

So result = **ZJQERX**

**Final Answer:** ZJQERX

**Q.20** In the following question, a situation is given. Choose the most appropriate response based on logic and behaviour.  
In a situation where your colleague appears anxious but avoids discussing the issue, what should you do?

- A. speak calmly and allow them time
- B. criticize them for being secretive
- C. show irritation over their silence
- D. compel them to explain immediately

**Answer:** A

**Sol: Information Given:** Situation: A colleague appears anxious but avoids discussing the issue.

**Logic:** Choose the response that is supportive, patient, and emotionally intelligent.

**Explanation:** Logic: Best behaviour is calm support without pressure.

(a) Speak calmly and allow them time → supportive and respectful ✓

(b) Criticize → negative, worsens anxiety

(c) Show irritation → discouraging

(d) Compel immediately → forceful, inappropriate

**Final Answer:** Speak calmly and allow them time.

**Final Correct Option: (a)**

**Q.21 Statements:** All novels are books. Some books are testprime. All testprime are educational.

**Conclusions:** I. Some books are educational.

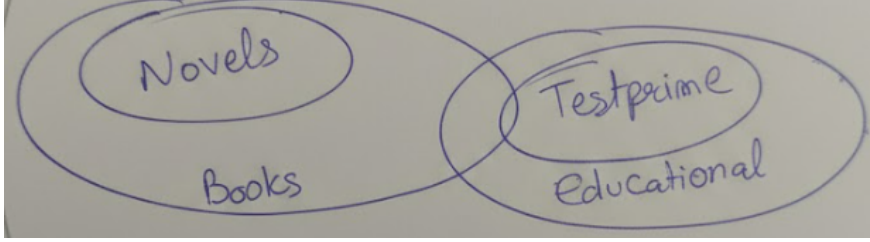
II. All novels may be testprime.

- A. only i follows
- B. only ii follows

- C. both i and ii follow
- D. neither i nor ii follows

**Answer:** C

**Sol: Information Given:** All novels are books. Some books are testprime. All testprime are educational.



**Conclusion I: Some books are educational** Step-by-step: Some books are testprime → All testprime are educational Therefore, some books are educational. ✓ Definitely true.

**Conclusion II: All novels may be testprime** Step-by-step: All novels are books. Some books are testprime. There is **no statement** saying novels cannot be testprime. So it is **possible** that all novels fall within the testprime books. ✓ "May be" conclusion is valid.

**Final Answer:** Both conclusions I and II follow.

**Final Correct Option:** (c)

**Q.22** In the following question, four words are given. Three of them belong to the same category. One is different. Identify the word that does not belong to the group.

- A. Spinach
- B. Lettuce
- C. Fenugreek
- D. Onion

**Answer:** D

**Sol: Information Given:** Words: Spinach, Lettuce, Fenugreek, Onion

**Logic:** Check the category/type of vegetable.

**Explanation:** Logic: Three are leafy vegetables; one is not.

Spinach → leafy vegetable

Lettuce → leafy vegetable

Fenugreek → leafy vegetable

Onion → bulb/root vegetable ✗

**Final Answer:** Onion

**Final Correct Option:** (d)

**Q.23** Find the odd one out from the following options.

- A. rose
- B. lotus
- C. aloe vera
- D. sunflower

**Answer:** C

**Sol: Information Given:** Options: rose, lotus, aloe vera, sunflower

**Logic:** Identify the category each belongs to.

**Explanation:** Logic: Three are flowering plants grown mainly for flowers.

Rose → flowering plant

Lotus → flowering aquatic plant

Sunflower → flowering plant

Aloe vera → medicinal succulent, not grown for flowers ✗

**Final Answer:** Aloe vera

**Final Correct Option:** (c)

**Q.24** A father is 16 years older than his child. After two years, the father's age will become exactly double the child's age. What is the present age of the child?

- A. 12 years
- B. 14 years
- C. 16 years
- D. 18 years

**Answer:** B

**Sol: Information Given:** Father is 16 years older than the child. After 2 years, father's age =  $2 \times$  child's age.

**Explanation:** Logic: Form equations from given conditions.

Let present age of child =  $x$

Father's present age =  $x + 16$

After 2 years: Father =  $x + 18$

Child =  $x + 2$

Condition:  $x + 18 = 2(x + 2)$

$x + 18 = 2x + 4$

$x = 14$ .

**Final Answer:** Present age of the child = 14 years

**Final Correct Option:** (b)

**Q.25** In the following question, a sequence of letters follows a specific rule. Identify the option that will correctly replace the question mark (?).  
Find the next letter in the series: H, F, D, B, ?

- A. L
- B. K
- C. Z
- D. M

**Answer:** C

**Sol: Information Given:** Letter series: H, F, D, B, ?

**Logic:** Observe the change in alphabetical positions.

**Explanation:** Logic: Each letter moves backward by 2 positions.

H(8) → F(6) → D(4) → B(2) → Z(26) (wrap after A)

**Final Answer:** Z

**Final Correct Option:** (c)

**Q.26** Flaxseed and soy products are rich sources of \_\_\_\_\_ which mimic estrogen-like activity in the human body.

- A. Alkaloids
- B. Phytoestrogens

- C. Enzymes
- D. Steroids

**Answer:** B

**Sol:** The correct answer is **(B) Phytoestrogens**

**Explanation:**

- Phytoestrogens are naturally occurring plant-derived compounds that are structurally or functionally similar to mammalian estrogens and their metabolites.
- Flaxseeds are particularly rich in lignans, a type of phytoestrogen, while soy products contain high levels of isoflavones.
- These compounds can bind to estrogen receptors in the human body, potentially exerting weak estrogenic or anti-estrogenic effects.
- In many plants, phytoestrogens serve as part of the natural defense mechanism against fungi or as part of the plant's internal communication system.
- For humans, consuming these can influence hormonal balance and are often studied for their role in heart health and bone density.

**Information Booster:**

- Isoflavones (found in soy) and Lignans (found in flax) are the two most studied classes of phytoestrogens.
- Because they are shaped similarly to estradiol (the main female sex hormone), they can sometimes 'trick' the body's receptors.

**Additional Knowledge:**

- Alkaloids (Option A): These are nitrogen-containing organic compounds like caffeine or morphine, often used as medicines or poisons.
- Enzymes (Option C): These are biological catalysts (usually proteins) that speed up chemical reactions in the body, such as amylase in digestion.
- Steroids (Option D): These are a broad class of organic compounds with a molecular structure containing four rings of carbon atoms, including hormones like testosterone and cortisol.

**Q.27** Consider the following statements about the India–France strategic partnership:

1. India and France have adopted a “Horizon 2047” roadmap to deepen their relationship over 25 years.
2. Both countries have agreed to collaborate on developing Small Modular Reactors (SMRs) for civil nuclear energy.
3. France has committed to supporting India's bid for a permanent seat on the UN Security Council.

Which of the above is/are correct?

- A. Only 1 and 2
- B. Only 2 and 3
- C. Only 1 and 3
- D. 1, 2 and 3 are correct

**Answer:** D

**Sol:** The correct answer is **(D) 1, 2 and 3 are correct**

**Explanation:**

- The "Horizon 2047" roadmap was adopted during Prime Minister Modi's visit to France in July 2023, marking the 25th anniversary of the Indo-French Strategic Partnership and looking ahead to 2047 (the centenary of India's independence).
- The partnership focuses on three pillars: Partnership for Security and Sovereignty, Partnership for the Planet, and Partnership for the People.
- Regarding nuclear energy, both nations have agreed to work on Small Modular Reactors (SMRs) and Advanced Modular Reactors (AMRs) to enhance clean energy cooperation.
- France has been a consistent and vocal supporter of India's permanent membership in a reformed United Nations Security Council (UNSC).
- Defense cooperation remains a cornerstone, with significant agreements on fighter jets (Rafale) and submarine technology (Scorpene).

**Information Booster:**

- France was the first Western country with which India signed a Strategic Partnership in 1998.
- The bilateral trade has seen significant growth, and France is one of the top foreign investors in India.

**Additional Knowledge:**

- Small Modular Reactors (SMRs) (Statement 2): These are advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors.
- UNSC Support (Statement 3): France also supports G4 nations (India, Germany, Japan, and Brazil) for permanent seats.

**Q.28** What is one of the major factors contributing to a country's low ranking in the World Happiness Index?

- A. High military expenditure
- B. Weak social support systems and political instability
- C. Excessive industrial growth
- D. High population density

**Answer:** B

**Sol:** The correct answer is **(B) Weak social support systems and political instability**

**Explanation:**

- The World Happiness Report, published by the UN Sustainable Development Solutions Network, uses six key variables to explain happiness scores: GDP per capita, social support, healthy life expectancy, freedom, generosity, and corruption.
- Social support (having someone to count on in times of trouble) is a critical pillar; countries where citizens feel isolated or unsupported by the state/community rank lower.
- Political instability and conflict create an environment of fear and uncertainty, which significantly diminishes the subjective well-being of the population.
- High levels of perceived corruption in government and business also correlate strongly with low happiness rankings.
- Lack of individual freedom to make life choices is another major factor that drags down the index score for many nations.

**Information Booster:**

- The index usually ranks Nordic countries (like Finland and Denmark) at the top due to their robust welfare systems and high levels of trust.
- India has historically ranked relatively low in this index, often cited due to rapid urbanization pressures and social disparities.

**Additional Knowledge:**

- High military expenditure (Option A): While it might affect the budget for social services, it is not a direct metric used to calculate the happiness score.
- Excessive industrial growth (Option C): Industrial growth usually leads to higher GDP per capita, which is a positive factor in the index, though environmental degradation might have indirect negative effects.
- High population density (Option D): Many high-ranking countries have low density, but density itself isn't a determining factor; for example, Singapore is dense but often ranks higher than many less-dense developing nations.

**Q.29** Which of the following is NOT considered as high-powered (reserve) money?

- Currency issued by the central bank
- Cash reserves of banks with RBI
- Base money
- Time deposits with commercial banks

**Answer:** D

**Sol:** The correct answer is **(D) Time deposits with commercial banks**

**Explanation:**

- High-powered money, also known as Reserve Money (M0), consists of the total liability of the monetary authority of the country (the RBI in India).
- It includes currency in circulation (notes and coins held by the public) and vault cash of commercial banks.
- It also includes the deposits held by the Government of India and commercial banks with the RBI.
- Time deposits (like Fixed Deposits) are part of broader money aggregates like M3, but they are not considered high-powered money because they cannot be immediately used as a basis for credit creation in the same way reserves can.
- High-powered money serves as the basis for the expansion of the money supply through the money multiplier effect.

**Information Booster:**

- The formula for Reserve Money (M0) is:  $M0 = \text{Currency in Circulation} + \text{Bankers' Deposits with RBI} + \text{'Other' Deposits with RBI}$ .
- It is called "high-powered" because it supports a much larger volume of credit and money in the economy.

**Additional Knowledge:**

- Currency issued (Option A): This is the most visible part of high-powered money held by the public.
- Cash reserves (Option B): Banks must keep a portion of their deposits with the RBI (Cash Reserve Ratio), which is a component of M0.
- Base money (Option C): This is simply another name for high-powered money or reserve money.

**Q.30** Which Indian mission is related to the development of reusable launch vehicle (RLV) technology?

- RLV-LEX
- Gaganyaan
- RISAT-2B
- Cartosat-3

**Answer:** A

**Sol:** The correct answer is **(A) RLV-LEX**

**Explanation:**

- RLV-LEX stands for Reusable Launch Vehicle Autonomous Landing Mission, conducted by ISRO.
- The primary goal is to develop essential technologies for a fully reusable launch vehicle to enable low-cost access to space.
- In these missions, a winged vehicle is released from a helicopter and performs an autonomous landing on a runway, simulating the return of a space shuttle.

- This technology is crucial for reducing the cost of satellite launches, as the most expensive parts of the rocket can be recovered and refurbished.
- ISRO successfully conducted the RLV LEX-01 and LEX-02 missions at the Aeronautical Test Range (ATR) in Chitradurga, Karnataka.

**Information Booster:**

- The final version of RLV will be a Two-Stage-to-Orbit (TSTO) fully reusable vehicle.
- It involves complex technologies like hypersonic flight, autonomous landing, and powered cruise flight.

**Additional Knowledge:**

- Gaganyaan (Option B): India's first human spaceflight mission intended to send a crew of three members to an orbit of 400 km for a 3-day mission.
- RISAT-2B (Option C): A Radar Imaging Satellite used for reconnaissance and disaster management, providing all-weather surveillance.
- Cartosat-3 (Option D): An advanced earth observation satellite with very high-resolution imaging capabilities, used for urban planning and resource management.

**Q.31** Consider the following statements about Humayun's Tomb:

1. It was built by Haji Begum in memory of Emperor Humayun.
2. It is located in Delhi and is considered a precursor to the Taj Mahal.
3. It was constructed during the reign of Akbar.

Which of the statements given above is/are correct?

- A. 1, 2 and 3  
B. 1 and 2 only  
C. 1 and 3 only  
D. 2 and 3 only

**Answer:** D

**Sol:** The correct answer is **(D) 1, 2 and 3**

**Explanation:**

- Humayun's Tomb was commissioned by his first wife and chief consort, Empress Bega Begum (also known as Haji Begum), in 1565–1572.
- It is the first garden-tomb on the Indian subcontinent and is located in the Nizamuddin East area of Delhi.
- It is often called the 'dormitory of the Mughals' because over 150 Mughal family members are buried here.
- The tomb introduced the Persian double-dome and the Charbagh (four-quadrant garden) style to India, which reached its pinnacle in the Taj Mahal.
- Since the construction started in 1565 and ended in 1572, it falls directly within the reign of Emperor Akbar (1556–1605).

**Information Booster:**

- The architect of the tomb was Mirak Mirza Ghiyas, a Persian architect.
- It was declared a UNESCO World Heritage site in 1993.

**Additional Knowledge:**

- Charbagh Style: A Persian-style garden layout based on the four gardens of Paradise mentioned in the Quran, divided by walkways or flowing water.
- Red Sandstone: The tomb was the first Indian structure to use red sandstone on such a massive scale.

**Q.32** Under the Bharatiya Sakshya Adhinyam (BSA), 2023, which of the following qualifies as an admission?

- A. A confession obtained by coercion  
B. A statement made by a witness about another person  
C. A statement suggesting an inference of fact made by a party to the case  
D. An anonymous written statement

**Answer:** C

**Sol:** The correct answer is **(C) A statement suggesting an inference of fact made by a party to the case**

**Explanation:**

- The Bharatiya Sakshya Adhinyam (BSA), 2023, replaced the Indian Evidence Act of 1872 to modernize the rules of evidence in India.
- An admission is defined as a statement, oral or documentary (including electronic form), which suggests any inference as to any fact in issue or relevant fact.
- It must be made by a party to the proceeding, their agent, or persons having proprietary or pecuniary interest in the subject matter.
- Admissions are substantive evidence but are not conclusive proof of the matters admitted; they may operate as estoppels.
- The BSA 2023 gives specific recognition to electronic records as primary evidence, aligning with the definition of statements/admissions.

**Information Booster:**

- While all confessions are admissions, not all admissions are confessions. Confessions typically refer to admissions of guilt in criminal matters.
- Admissions can be judicial (made during proceedings) or extra-judicial (made outside the court).

**Additional Knowledge:**

- Coerced confession (Option A): Under the BSA (and the old Act), a confession made under inducement, threat, or promise is irrelevant and

inadmissible in criminal proceedings.

- Witness statement (Option B): Generally categorized under testimony or hearsay rules rather than 'admission' (which specifically pertains to parties to the suit).
- Anonymous statement (Option D): These usually lack the necessary 'authenticity' and 'attribution' to a party required to qualify as a formal admission.

**Q.33** The Dalli–Rajhara and Bailadila regions are famous for the mining of which mineral?

- A. Bauxite
- B. Manganese
- C. Iron ore
- D. Copper

**Answer:** C

**Sol:** The correct answer is **(C) Iron ore**

**Explanation:**

- Dalli-Rajhara and Bailadila are located in Chhattisgarh and are home to some of the largest and best-quality iron ore deposits in India.
- The iron ore from Dalli-Rajhara is the primary source of raw material for the Bhilai Steel Plant.
- The Bailadila range (Dantewada district) contains high-grade hematite ore, which is famous for its high iron content.
- A significant portion of the ore from Bailadila is exported to Japan and South Korea through the Visakhapatnam port.
- These mines are mechanized and operated by the National Mineral Development Corporation (NMDC) and Steel Authority of India Limited (SAIL).

**Information Booster:**

- Bailadila means 'hump of an ox' in the local language, referring to the shape of the mountain range.
- Chhattisgarh is one of the leading producers of iron ore in India, along with Odisha and Karnataka.

**Additional Knowledge:**

- Bauxite (Option A): Majorly found in the Koraput and Rayagada districts of Odisha and Amarkantak plateau in Chhattisgarh.
- Manganese (Option B): Primarily found in the Balaghat belt of Madhya Pradesh and Nagpur-Bhandara belt of Maharashtra.
- Copper (Option D): Major deposits are in Malanjkhand (Madhya Pradesh), Khetri (Rajasthan), and Singhbhum (Jharkhand).

**Q.34** Which government scheme provides an annual financial benefit of ₹6,000 to eligible landholding farmer families across India?

- A. Pradhan Mantri Fasal Bima Yojana (PMFBY)
- B. Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)
- C. Pradhan Mantri Krishi Sinchai Yojana (PMKSY)
- D. Deendayal Antyodaya Yojana - NRLM

**Answer:** B

**Sol:** The correct answer is **(B) Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)**

**Explanation:**

- PM-KISAN is a Central Sector Scheme launched in February 2019 (effective from December 2018) to provide income support to all landholding farmers' families.
- Under the scheme, an amount of ₹6,000 per year is released in three 4-monthly installments of ₹2,000 each.
- The funds are transferred directly into the bank accounts of the beneficiaries through Direct Benefit Transfer (DBT) mode.
- Initially, the scheme was for small and marginal farmers (holding up to 2 hectares), but it was later extended to all landholding farmers.
- The definition of family for the scheme is husband, wife, and minor children.

**Information Booster:**

- The identification of beneficiaries is the responsibility of the State and Union Territory Governments.
- Certain categories like institutional landholders, constitutional post holders, and income tax payers are excluded from the scheme.

**Additional Knowledge:**

- PMFBY (Option A): A crop insurance scheme that provides financial support to farmers suffering crop loss/damage arising out of unforeseen events.
- PMKSY (Option C): A scheme focused on improving on-farm water use efficiency ("Per Drop More Crop") and expanding cultivable areas under assured irrigation.
- DAY-NRLM (Option D): A poverty alleviation project implemented by the Ministry of Rural Development, focused on promoting self-employment and organization of rural poor into Self Help Groups (SHGs).

**Q.35** According to the Constitution of India, what is the maximum strength of a State Legislative Assembly?

- A. 400
- B. 450
- C. 500
- D. 550

**Answer:** C

**Sol:** The correct answer is **(C) 500**

**Explanation:**

- Article 170 of the Indian Constitution prescribes the composition of the Legislative Assemblies (Vidhan Sabha).
- The maximum strength of an assembly is fixed at 500 members, and the minimum strength is 60 members.
- However, some states like Sikkim, Goa, and Mizoram have smaller assemblies (e.g., 32, 40) due to their small population and geographical size, which are exceptions provided by Parliamentary acts.
- The members are chosen by direct election from territorial constituencies in the State.
- The size of the assembly depends on the population of the state, determined after each census (currently based on the 1971 census until 2026).

**Information Booster:**

- Uttar Pradesh has the largest Legislative Assembly in India with 403 members.
- The term of the Legislative Assembly is 5 years unless dissolved earlier by the Governor.

**Additional Knowledge:**

- 550 (Option D): This refers to the maximum sanctioned strength of the Lok Sabha (House of the People) after the removal of Anglo-Indian nominated seats.
- Minimum Strength: While the general rule is 60, states like Sikkim (32), Mizoram (40), and Goa (40) serve as constitutional exceptions.

**Q.36** The Nationalisation of major commercial banks in India took place during the \_\_\_\_ Five-Year Plan.

- A. Third
- B. Fourth
- C. Fifth
- D. Sixth

**Answer:** B

**Sol:** The correct answer is **(B) Fourth**

**Explanation:**

- The first major wave of bank nationalization occurred on July 19, 1969, under the leadership of Prime Minister Indira Gandhi.
- During this phase, 14 major commercial banks with deposits exceeding ₹50 crore were nationalized.
- The Fourth Five-Year Plan spanned from 1969 to 1974, thus encompassing this significant economic move.
- The goal was to align the banking sector with the socialistic priorities of the government and ensure credit reached rural and agricultural sectors.
- Prior to this, banks were largely controlled by industrial houses and focused on urban lending.

**Information Booster:**

- A second phase of nationalization took place in 1980 (during the Sixth Plan), where 6 more banks were nationalized.
- The 1969 nationalization is considered a turning point in Indian banking, leading to a massive expansion of bank branches in rural India.

**Additional Knowledge:**

- Third Plan (Option A): 1961–1966; focused on agriculture and wheat production but hampered by wars and drought.
- Fifth Plan (Option B): 1974–1978; focused on 'Garibi Hatao' (poverty removal) and employment.
- Sixth Plan (Option D): 1980–1985; marked the beginning of economic liberalization and the second phase of bank nationalization.

**Q.37** The formation of bright and dark fringes in Young's double-slit experiment is due to:

- A. Reflection of light
- B. Refraction of light
- C. Superposition of light waves
- D. Polarization of light

**Answer:** C

**Sol:** The correct answer is **(C) Superposition of light waves**

**Explanation:**

- Young's double-slit experiment (YDSE) is the classic demonstration of the interference of light, proving its wave nature.
- When light from a coherent source passes through two closely spaced slits, the waves emerging from the slits spread out and overlap.
- Superposition occurs where these two waves meet; if they are in phase, constructive interference creates a bright fringe.

- If the waves meet out of phase (crest meets trough), destructive interference occurs, resulting in a dark fringe.
- This process creates a stable interference pattern of alternating bright and dark bands on a screen.

**Information Booster:**

- For a stable pattern, the sources must be coherent (constant phase difference) and monochromatic (single wavelength).
- The fringe width (distance between two consecutive bright or dark fringes) is given by  $\beta = \frac{\lambda D}{d}$ , where  $\lambda$  is wavelength,  $D$  is screen distance, and  $d$  is slit separation.

**Additional Knowledge:**

- Reflection (Option A): The bouncing back of light when it hits a surface (e.g., a mirror).
- Refraction (Option B): The bending of light as it passes from one transparent medium to another of different density.
- Polarization (Option D): The process of restricting light vibrations to a single plane, proving light is a transverse wave.

**Q.38** Which of the following folk dances belongs to the state of Chhattisgarh?

- A. Panthi
- B. Rouf
- C. Garba
- D. Yakshagana

**Answer:** A

**Sol:** The correct answer is **(A) Panthi**

**Explanation:**

- Panthi dance is one of the most important folk dance forms of the Satnami community in Chhattisgarh.
- It is performed on Maghi Purnima, the birth anniversary of Guru Ghasidas, the founder of the Satnami sect.
- The dance is characterized by rhythm, vigorous movements, and the formation of human pyramids, reflecting the spiritual devotion of the performers.
- Performers usually wear white dhotis and dance around a 'Jaitkhamb' (a symbol of their faith) to the accompaniment of traditional instruments like the 'Mridang' and 'Jhanjh'.
- Other prominent dances from Chhattisgarh include Raut Nacha, Pandavani, and Karma.

**Information Booster:**

- Pandavani is a world-renowned folk ballad from Chhattisgarh, famously performed by Teejan Bai.
- Raut Nacha is performed by the Yaduvanshi community during Diwali.

**Additional Knowledge:**

- Rouf (Option B): A traditional folk dance of Jammu and Kashmir, usually performed by women during the spring season and festivals like Eid.
- Garba (Option C): A popular folk dance from Gujarat, performed during the Navratri festival, involving circular movements around a lamp or deity.
- Yakshagana (Option D): A traditional theater-dance form from Karnataka that combines dance, music, dialogue, and unique costumes/makeup, usually depicting stories from epics.

**Q.39** Read the following statements carefully and choose the correct option:

Statement 1: India has the largest adolescent population in the world.

Statement 2: Adolescence is defined by the WHO as the age group of 10–19 years.

- A. Only 1
- B. Only 2
- C. Both 1 and 2 are correct
- D. Neither 1 nor 2 is correct

**Answer:** C

**Sol:** The correct answer is **(C) Both 1 and 2 are correct**

**Explanation:**

- Statement 1 is correct: India is home to the largest number of adolescents in the world, totaling approximately 253 million (about one-fifth of the total population). This demographic represents a huge 'demographic dividend' if managed correctly.
- Statement 2 is correct: The World Health Organization (WHO) formally defines 'adolescents' as individuals in the 10–19 year age group.
- This period is characterized by rapid physical growth, psychological development, and social transition from childhood to adulthood.
- The Government of India has various programs like 'Rashtriya Kishor Swasthya Karyakram' (RKSK) to address the health and nutritional needs of this specific group.
- Addressing issues like anemia, reproductive health, and mental well-being is crucial for this population segment in India.

**Information Booster:**

- 'Youth' is defined by the UN as the 15–24 age group, whereas 'Young People' covers the range of 10–24 years.
- Adolescents in India face significant challenges including early marriage in some regions and high rates of nutritional deficiency (especially iron).

**Additional Knowledge:**

- Demographic Dividend: The economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population is larger than the non-working-age share.
- Census 2011: Data from the last official census highlighted that India has one of the youngest populations globally, with a median age under 30.

**Q.40** Consider the following statements about the novel *Untouchable* by Mulk Raj Anand:

Assertion (A): The novel is a powerful critique of the caste system in India.

Reason (R): It vividly narrates the single day in the life of Bakha, a sweep who faces continuous discrimination and dehumanization.

- A. Both A and R are true, and R correctly explains A.  
 B. Both A and R are true, but R does not correctly explain A.  
 C. A is true, but R is false.  
 D. A is false, but R is true.

**Answer:** A

**Sol:** The correct answer is **(A) Both A and R are true, and R correctly explains A.**

**Explanation:**

- Published in 1935, "Untouchable" is one of the most significant works of Indian English literature.
- The Assertion (A) is true: Mulk Raj Anand used the novel as a vehicle for social reform, exposing the cruelty and hypocrisy of the caste-based social hierarchy.
- The Reason (R) is true and explains (A): By focusing on just one day in the life of Bakha, a young sweeper, Anand demonstrates how pervasive and relentless the discrimination is—from the way he must announce his presence to the abuse he receives for accidentally touching a high-caste man.
- The novel concludes with three potential solutions for Bakha's plight: conversion to Christianity, the Gandhian approach of social change, or the introduction of the flush toilet (technology) which would eliminate the need for manual scavenging.
- E.M. Forster wrote the preface for the novel, helping it gain international recognition.

**Information Booster:**

- Mulk Raj Anand, along with R.K. Narayan and Raja Rao, is considered one of the pioneers of Indo-Anglian fiction.
- The novel was written in the context of the Indian Independence movement and the growing discourse on Dalit rights led by B.R. Ambedkar and Mahatma Gandhi.

**Additional Knowledge:**

- Coolie (1936): Another famous novel by Mulk Raj Anand that deals with the exploitation of the poor and the working class.
- Manual Scavenging: The practice that Bakha performs, which has been legally banned in modern India through several acts, including the 2013 Act.

**Q.41** Which of the following statements about the Mughal Jagirdari system is/are correct?

Statement I: Jagirs were transferable and not hereditary.

Statement II: Jagirdars collected revenue on behalf of the state.

- A. Only I  
 B. Only II  
 C. Both I and II  
 D. Neither I nor II

**Answer:** C

**Sol:** The correct answer is **(C) Both I and II**

**Explanation:**

- The Jagirdari system was a key administrative and land revenue mechanism under the Mughals where state officers (Mansabdars) were assigned land (Jagirs) instead of cash salaries.
- Statement I is correct: To prevent local power bases from forming, the Mughal emperors regularly transferred Jagirdars from one region to another (usually every 3-4 years). They were not hereditary owners.
- Statement II is correct: The primary duty of a Jagirdar was to collect land revenue (Mal) from the assigned territory as per state assessment and use it to maintain their required military contingent and personal expenses.
- The system was highly centralized under Akbar but began to face a 'Jagirdari crisis' during the later Mughal period, leading to the decline of the empire.
- Unlike the Zamindars, who had hereditary rights over land, Jagirdars were purely state employees holding temporary revenue assignments.

**Information Booster:**

- 'Khalisa' land was land whose revenue went directly to the royal treasury, while 'Jagir' land was assigned to officials.
- The office of the Diwan oversaw the assignment of Jagirs to ensure the estimated revenue (Jama) matched the official's salary (Talab).

**Additional Knowledge:**

- Mansabdari System: The ranking system of the Mughal military-bureaucracy, within which the Jagirdari system operated.
- Paibaqi: Land that was in the process of being assigned as a Jagir but was currently managed by the state.

**Q.42** Read the following statements and choose the correct option:

Statement 1: The Deccan Plateau is bounded by the Western Ghats on the west and the Eastern Ghats on the east.

Statement 2: Most rivers of the Deccan Plateau flow eastward into the Bay of Bengal.

- A. Only 1
- B. Only 2
- C. Both 1 and 2 are correct
- D. Neither 1 nor 2 is correct

**Answer:** C

**Sol:** The correct answer is **(C) Both 1 and 2 are correct**

**Explanation:**

- The Deccan Plateau is a large triangular plateau in India, making up most of the southern part of the country.
- Statement 1 is correct: It is geographically bordered by the Satpura and Vindhya ranges to the north, the Western Ghats (Sahyadri) to the west, and the Eastern Ghats to the east.
- Statement 2 is correct: The plateau is tilted from west to east. Because of this general slope, major rivers like the Godavari, Krishna, and Kaveri originate in the Western Ghats and flow eastward across the plateau to drain into the Bay of Bengal.
- The Western Ghats are higher and more continuous than the Eastern Ghats, which are lower and broken by river valleys.
- The black soil (regur) found in the northwestern part of the plateau is highly suitable for cotton cultivation.

**Information Booster:**

- The Narmada and Tapti rivers are exceptions as they flow westward into the Arabian Sea through rift valleys.
- Anai Mudi (2,695 m) is the highest peak in the Western Ghats and the highest point in South India.

**Additional Knowledge:**

- Western Ghats (Option A): They are a UNESCO World Heritage site and one of the world's eight 'hottest hotspots' of biological diversity.
- Eastern Ghats (Option B): They stretch from West Bengal/Odisha through Andhra Pradesh to Tamil Nadu, with Mahendragiri being a notable peak.

**Q.43** Consider the following statements about the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC):

1. It is a regional organization comprising all eight SAARC member states.
2. It serves as a bridge between South Asia and Southeast Asia.
3. Pakistan is a member country of BIMSTEC.

Which of the statements given above is/are correct?

- A. 1 only
- B. 2 only
- C. 1 and 3 only
- D. None of the above

**Answer:** B

**Sol:** The correct answer is **(B) 2 only**

**Explanation:**

- BIMSTEC is a regional organization that came into being on June 6, 1997, through the Bangkok Declaration.
- Statement 1 is incorrect: It does not include all SAARC members. It comprises seven members: five from South Asia (Bangladesh, Bhutan, India, Nepal, Sri Lanka) and two from Southeast Asia (Myanmar, Thailand).
- Statement 2 is correct: By including countries from both South and Southeast Asia, BIMSTEC acts as a platform for cooperation between the two regions, aligning with India's 'Act East' policy.
- Statement 3 is incorrect: Pakistan is not a member of BIMSTEC. This is one reason why India has prioritized BIMSTEC over SAARC in recent years, as SAARC meetings have been stalled due to regional tensions.
- The organization focuses on 14 sectors of cooperation, including trade, technology, energy, and transport.

**Information Booster:**

- The BIMSTEC Secretariat is located in Dhaka, Bangladesh.
- The 5th BIMSTEC Summit (2022) led to the adoption of the BIMSTEC Charter, giving the group a formal legal identity.

**Additional Knowledge:**

- SAARC (South Asian Association for Regional Cooperation): Includes Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.
- BBIN: An initiative within BIMSTEC involving Bangladesh, Bhutan, India, and Nepal for motor vehicle agreements and water power cooperation.

**Q.44** Consider the following statements regarding India's climate commitments:

1. India aims to reduce the emissions intensity of its GDP by 45% by 2030 from 2005 levels.
2. India has committed to achieve net-zero emissions by 2070.
3. India's updated NDC includes achieving 50% non-fossil fuel-based electricity capacity by 2025.

Which of the statements given above is/are correct?

- A. 1 and 2 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

**Answer:** A

**Sol:** The correct answer is **(A) 1 and 2 only**

**Explanation:**

- Statement 1 is correct: As part of its updated Nationally Determined Contributions (NDCs) submitted in 2022, India pledged to reduce the emissions intensity of its GDP by 45% by 2030, compared to the 2005 level.
- Statement 2 is correct: Prime Minister Modi announced at COP26 in Glasgow (2021) that India will achieve the target of net-zero emissions by the year 2070.
- Statement 3 is incorrect: The target to achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources is set for **2030**, not 2025.
- These commitments are part of India's 'Panchamrit' strategy to combat climate change.
- India is also working toward creating an additional carbon sink of 2.5 to 3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover by 2030.

**Information Booster:**

- India is the only G20 nation on track to meet its climate targets under the Paris Agreement.
- The LiFE (Lifestyle for Environment) movement was also introduced by India to promote sustainable living.

**Additional Knowledge:**

- Emissions Intensity: The amount of greenhouse gas emissions produced per unit of GDP.
- Net Zero: A state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere.

**Q.45** Consider the following statements marked as Assertion (A) and Reason (R). Mark the correct options:

Assertion (A): Karnam Malleswari was the first Indian woman to win an Olympic medal.

Reason (R): She achieved this historic feat by winning a gold medal in weightlifting at the 2000 Sydney Olympics.

- A. Both A and R are true, and R correctly explains A.
- B. Both A and R are true, but R does not explain A.
- C. A is true, but R is false.
- D. A is false, but R is true.

**Answer:** C

**Sol:** The correct answer is **(C) A is true, but R is false.**

**Explanation:**

- Assertion (A) is correct: Karnam Malleswari made history at the 2000 Sydney Olympics by becoming the first Indian woman ever to win an Olympic medal.
- Reason (R) is incorrect: She did not win a gold medal; she won a **bronze medal** in the 69 kg weightlifting category.
- She lifted 110 kg in the 'snatch' and 130 kg in the 'clean and jerk' for a total of 240 kg.
- Her achievement was a landmark moment for women's sports in India, breaking a long drought and inspiring a generation of female athletes.
- Before her, only Indian men (in hockey, wrestling, and tennis) had won Olympic medals for independent India.

**Information Booster:**

- She was awarded the Rajiv Gandhi Khel Ratna (now Major Dhyan Chand Khel Ratna) in 1995.
- She also received the Padma Shri in 1999.

**Additional Knowledge:**

- Other Women Medalists: Following Malleswari, Saina Nehwal (Badminton) and Mary Kom (Boxing) won bronze in 2012, P.V. Sindhu won silver (2016) and bronze (2020), and Mirabai Chanu won silver (2020).
- First Gold for Indian Woman: As of early 2026, no Indian woman has yet won an individual Olympic gold medal.

**Q.46** Match the following Archery terms with their correct meanings:

Column A (Terms) Column B (Meanings)

- A. Bullseye 1. Maximum score area  
 B. Quiver 2. Holder for arrows  
 C. Draw length 3. Distance string is pulled  
 D. Nocking point 4. Position where arrow is placed

Choose the correct answer:

- A. A-1, B-2, C-3, D-4  
 B. A-2, B-1, C-4, D-3  
 C. A-3, B-2, C-1, D-4  
 D. A-1, B-3, C-2, D-4

**Answer:** A

**Sol:** The correct answer is **(A) A-1, B-2, C-3, D-4**

**Explanation:**

- Bullseye: In competitive archery, this is the gold-colored center of the target, which awards the maximum points (usually 10).
- Quiver: This is a container or holder specifically designed to carry arrows safely, which can be worn on the archer's back, waist, or attached to the bow.
- Draw Length: This refers to the distance an archer pulls the bowstring back from the resting position to their anchor point at full draw.
- Nocking Point: This is the specific spot on the bowstring where the end of the arrow (the nock) is attached before firing.
- Understanding these terms is essential for both Olympic archery and traditional practices.

**Information Booster:**

- Archery is the national sport of Bhutan.
- In the Olympics, the distance from the archer to the target is 70 meters.

**Additional Knowledge:**

- Fletching: The feathers or plastic vanes on the back of an arrow that stabilize it during flight.
- Anchor Point: A consistent spot on the archer's face where they pull the string to before releasing.
- Bow Limb: The upper and lower arms of a bow that bend to store energy.

**Q.47** Which of the following best describes the role of Foreign Institutional Investors (FIIs) in India?

- A. Providing subsidies to farmers  
 B. Financing government welfare schemes  
 C. Investing in India's equity and debt markets  
 D. Funding rural employment programmes

**Answer:** C

**Sol:** The correct answer is **(C) Investing in India's equity and debt markets**

**Explanation:**

- FIIs (Foreign Institutional Investors) are investment funds or entities that invest in a country outside of the one in which they are registered or headquartered.
- In India, they play a crucial role by bringing in foreign capital into the stock exchanges (equity) and the bond markets (debt).

- They are regulated by the Securities and Exchange Board of India (SEBI).
- FII investment is often referred to as 'hot money' because it can be withdrawn quickly, leading to volatility in the exchange rate and stock market indices.
- Their entry increases liquidity in the Indian markets and provides necessary capital for Indian companies to expand.

**Information Booster:**

- In 2014, SEBI introduced the Foreign Portfolio Investor (FPI) regime, which harmonized various categories like FIIs and Qualified Foreign Investors (QFIs).
- FIIs are institutional entities like pension funds, mutual funds, or insurance companies.

**Additional Knowledge:**

- FDI (Foreign Direct Investment): Unlike FII, FDI involves a long-term interest and management control in a domestic company (e.g., setting up a factory).
- Hot Money (Option C): FII flows are sensitive to global interest rates (like US Fed rates) and geopolitical stability.
- Subsidies/Welfare (Options A, B, D): These are government fiscal responsibilities funded by tax revenue or government borrowing, not by institutional investors.

**Q.48** Who launched the nationwide campaign “Viksit Bharat @2047”?

- A. Amit Shah
- B. Narendra Modi
- C. Rajnath Singh
- D. Jagdeep Dhankhar

**Answer:** B

**Sol:** The correct answer is **(B) Narendra Modi**

**Explanation:**

- Prime Minister Narendra Modi launched 'Viksit Bharat @2047: Voice of Youth' in December 2023 via video conferencing.
- The initiative aims to provide a platform for the youth of the country to contribute ideas to the vision of making India a developed nation by 2047, the centenary of its independence.
- The campaign focuses on various aspects of development including economic growth, social progress, environmental sustainability, and good governance.
- It encourages students and young professionals to share their suggestions through the MyGov portal.
- The PM emphasized that the youth are both the 'agents of change' and the 'beneficiaries' of a developed India.

**Information Booster:**

- The vision involves transforming India into a US \$30 trillion economy by 2047.
- It follows the 'Panch Pran' (five pledges) announced by the PM during the Independence Day speech of 2022.

**Additional Knowledge:**

- Amit Shah (Option A): Currently the Minister of Home Affairs and Minister of Cooperation.
- Rajnath Singh (Option C): Currently the Minister of Defence.
- Jagdeep Dhankhar (Option D): The Vice President of India and ex-officio Chairman of the Rajya Sabha.

**Q.49** Match the geological period with the mass extinction event that marked its end:

Column A (Period) Column B (Extinction Event)

1. Permian A. End-Cretaceous (K-Pg) extinction
2. Cretaceous B. End-Devonian extinction
3. Devonian C. End-Permian (“The Great Dying”) extinction

Choose the correct answer:

- A. 1-A, 2-C, 3-B
- B. 1-C, 2-A, 3-B
- C. 1-B, 2-A, 3-C
- D. 1-C, 2-B, 3-A

**Answer:** B

**Sol:** The correct answer is **(B) 1-C, 2-A, 3-B**

**Explanation:**

- Permian Period (1-C): The End-Permian extinction, often called "The Great Dying," occurred about 252 million years ago. It is the most severe extinction event in Earth's history, wiping out over 90% of marine species and 70% of terrestrial vertebrates.
- Cretaceous Period (2-A): The End-Cretaceous extinction (K-Pg) happened about 66 million years ago. It is famous for the extinction of non-avian dinosaurs, likely caused by a massive asteroid impact and volcanic activity.
- Devonian Period (3-B): The Late Devonian mass extinction occurred roughly 375 million years ago, primarily affecting marine life like corals and

trilobites.

- These are part of the 'Big Five' mass extinctions that have shaped the evolution of life on Earth.
- Understanding these events helps scientists study current biodiversity loss and climate change impacts.

**Information Booster:**

- The other two of the 'Big Five' are the End-Ordovician and End-Triassic extinctions.
- Scientists currently argue we are entering a 'Sixth Mass Extinction' (the Anthropocene) due to human activity.

**Additional Knowledge:**

- K-Pg Boundary (Option A): Marked by a thin layer of sediment found around the world, rich in iridium, an element common in asteroids.
- Trilobites (Option C): A group of extinct marine arachnomorph arthropods that survived for nearly 300 million years before finally perishing in the Permian extinction.

**Q.50** Consider the following statements:

1. The President can dissolve the Lok Sabha only on the advice of the Council of Ministers.
2. The Governor plays a discretionary role in appointing the Chief Minister in a hung Assembly.
3. A Money Bill can be introduced only with the prior recommendation of the President.

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 1 and 3 only
- D. 1, 2 and 3

**Answer:** D

**Sol:** The correct answer is **(D) 1, 2 and 3**

**Explanation:**

- Statement 1 is correct: Under Article 85, the President has the power to dissolve the Lok Sabha. However, as per the constitutional convention and the 42nd/44th Amendments, this is done on the aid and advice of the Council of Ministers headed by the PM.
- Statement 2 is correct: While the Governor normally appoints the leader of the majority party, in a 'hung assembly' (where no single party has a clear majority), the Governor uses situational discretion to invite the person most likely to command a majority.
- Statement 3 is correct: Under Article 117, a Money Bill (defined in Article 110) cannot be introduced in the Lok Sabha without the prior recommendation of the President.
- These provisions highlight the role of the executive in the legislative process and the checks and balances within the Indian Parliamentary system.
- The President's recommendation is also required for certain other bills involving expenditure from the Consolidated Fund of India.

**Information Booster:**

- The Speaker of the Lok Sabha has the final authority to certify whether a bill is a Money Bill or not.
- The Rajya Sabha has limited powers regarding Money Bills; it can only suggest amendments and must return the bill within 14 days.

**Additional Knowledge:**

- Article 74: Mandates that there shall be a Council of Ministers with the PM at the head to aid and advise the President.
- Constitutional Discretion: Unlike the President, the Governor has certain 'explicit' discretionary powers (e.g., reserving a bill for the President under Article 200).

**Q.51** A train crosses a 200-meter-long platform in 30 seconds and a man standing on the platform in 18 seconds. What is the length of the train?

- A. 250 m
- B. 280 m
- C. 300 m
- D. 320 m

**Answer:** C

**Sol: Given:**

Time for platform (30s) corresponds to Distance = Train + Platform.

Time for man (18s) corresponds to Distance = Train.

Platform Length = 200m.

**Formula Used:**

Speed = Distance / Time

**Solution:**

Let Train Length = L.

$$\text{Speed } S = \frac{L}{18}$$

Also,  $S = \frac{L + 200}{30}$

Equating speeds:

$$\frac{L}{18} = \frac{L + 200}{30}$$

$$\frac{L}{3} = \frac{L + 200}{5}$$

$$5L = 3(L + 200)$$

$$5L = 3L + 600$$

$$2L = 600$$

$$L = 300 \text{ m}$$

**Final Answer**

So the correct answer is (c)

**Q.52** From the top of a 100 m high tower, the angle of depression of a car changes from  $30^\circ$  to  $45^\circ$ . What is the distance travelled by the car during this observation?

- A.  $100(\sqrt{3} - 1)$  m
- B.  $100(\sqrt{3} + 1)$  m
- C.  $50(\sqrt{3} - 1)$  m
- D.  $100\sqrt{3}$  m

**Answer:** A

**Sol: Given:**

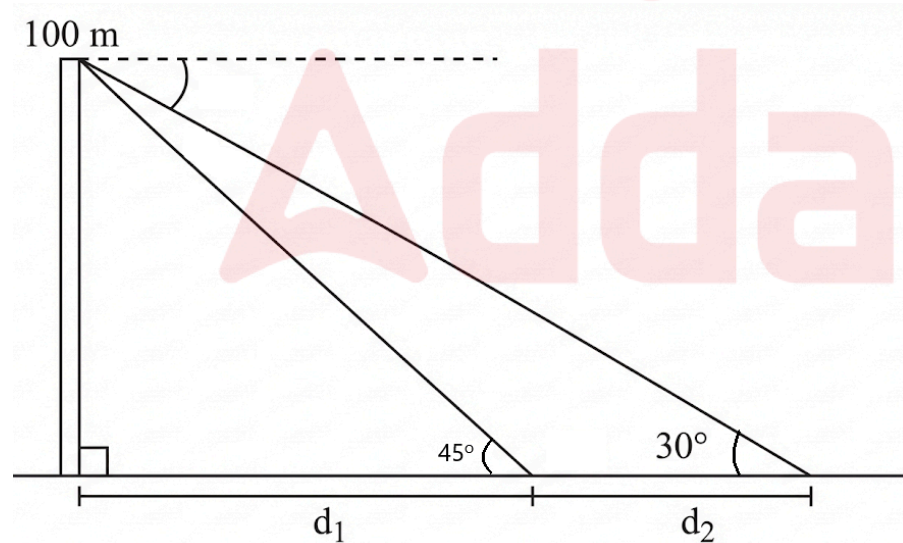
Height (h) = 100 m

Angles of depression = Angles of elevation =  $30^\circ, 45^\circ$

**Formula Used:**

Distance =  $h \cot \theta$

**Solution:**



Let  $d_1$  be distance when angle is  $30^\circ$ .

$$d_1 = 100 \cot 30^\circ = 100\sqrt{3}$$

Let  $d_2$  be distance when angle is  $45^\circ$ .

$$d_2 = 100 \cot 45^\circ = 100(1) = 100$$

Distance travelled =  $d_1 - d_2$

$$= 100\sqrt{3} - 100$$

$$= 100(\sqrt{3} - 1) \text{ m}$$

**Final Answer**

So the correct answer is (a)

**Q.53** The value of:  $(2 + \sqrt{3}) + \left(\frac{1}{2 - \sqrt{3}}\right) - (4 + 2\sqrt{3})$  is:

- A. 1
- B. 0
- C.  $2\sqrt{3}$
- D. 4

**Answer:** B

**Sol: Given**

$$\text{Expression: } (2 + \sqrt{3}) + \frac{1}{2 - \sqrt{3}} - (4 + 2\sqrt{3})$$

**Formula Used**

Rationalization:

$$\frac{1}{a - \sqrt{b}} \times \frac{a + \sqrt{b}}{a + \sqrt{b}} = \frac{a + \sqrt{b}}{a^2 - b}$$

**Solution:**

$$\begin{aligned} & (2 + \sqrt{3}) + \left(\frac{1}{2 - \sqrt{3}}\right) - (4 + 2\sqrt{3}) \\ &= (2 + \sqrt{3}) + \left(\frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}}\right) - (4 + 2\sqrt{3}) \\ &= (2 + \sqrt{3}) + \left(\frac{2 + \sqrt{3}}{4 - 3}\right) - (4 + 2\sqrt{3}) \\ &= (2 + \sqrt{3}) + (2 + \sqrt{3}) - (4 + 2\sqrt{3}) \\ &= (4 + 2\sqrt{3}) - (4 + 2\sqrt{3}) \\ &= 0 \end{aligned}$$

**Q.54** A shopkeeper bought 50 vases for ₹5000. 5 vases were broken during transport. At what price per vase should he sell the remaining vases to make an overall profit of 10%?

- A. ₹120.50
- B. ₹115.33
- C. ₹122.22
- D. ₹110.00

**Answer:** C

**Sol: Given:**

Total Cost Price (CP) = ₹5000  
 Total vases = 50  
 Broken vases = 5  
 Remaining vases = 45  
 Desired Profit = 10%

**Formula Used:**

$$SP = CP \times \left(1 + \frac{P\%}{100}\right)$$

**Solution:**

Calculate Total Selling Price needed:

$$\text{Total SP} = 5000 \times \frac{110}{100} = 5500$$

Calculate SP per remaining vase:

$$\text{SP per vase} = \frac{\text{Total SP}}{\text{Remaining Vases}}$$

$$\text{SP per vase} = \frac{5500}{45}$$

$$\text{SP per vase} = \frac{1100}{9} \approx 122.22$$

**Final Answer**

So the correct answer is (c)

**Q.55** A and B invest ₹60,000 and ₹40,000, respectively. After one year, the total profit is ₹30,000. Determine A's share of the profit.

- A. ₹12,000
- B. ₹18,000
- C. ₹15,000
- D. ₹20,000

**Answer:** B

**Sol: Given:**

Investment A = ₹60,000  
 Investment B = ₹40,000  
 Total Profit = ₹30,000  
 Time = 1 year (same for both)

**Formula Used:**

Ratio of Profit = Ratio of Investment (when time is equal)

**Solution:**

Calculate the ratio of investments:

$$A : B = 60000 : 40000$$

$$A : B = 6 : 4 = 3 : 2$$

Calculate A's share:

$$\text{A's Share} = \frac{3}{3+2} \times 30000$$

$$\text{A's Share} = \frac{3}{5} \times 30000$$

$$\text{A's Share} = 3 \times 6000 = 18000$$

**Final Answer**

So the correct answer is (b)

**Q.56** A 60-litre mixture of milk and water is in the ratio 2:1. Some of it is removed and replaced with pure milk. The final ratio becomes 5:1. How much of the mixture was replaced?

- A. 20 litres
- B. 24 litres
- C. 30 litres
- D. 36 litres

**Answer:** C

**Sol: Given:**

Initial mixture = 60L (Ratio 2:1)

Final Ratio = 5:1

Replacement is with Milk.

**Formula Used:**

Concentration of constant component (Water).

**Solution:**

Initial Water amount =  $\frac{1}{3} \times 60 = 20$  L.

Let x litres of mixture be removed and replaced by milk.

When x litres are removed, water removed =  $\frac{1}{3}x$ .

Remaining Water =  $20 - \frac{x}{3}$ .

Since only milk is added, the amount of water remains the same in the final mixture calculation conceptually, but the total volume is restored to 60L.

In the final mixture (60L), Water ratio is  $1/(5+1) = 1/6$ .

Final Water amount =  $\frac{1}{6} \times 60 = 10$  L.

Equating the water content:

$$20 - \frac{x}{3} = 10$$

$$10 = \frac{x}{3}$$

$$x = 30$$

**Final Answer**

So the correct answer is (c)

**Q.57** Simplify:  $\sqrt{128} + \sqrt{72} - \sqrt{32}$

- A.  $8\sqrt{2}$
- B.  $10\sqrt{2}$
- C.  $12\sqrt{2}$
- D.  $6\sqrt{2}$

**Answer:** B

**Sol: Given:**

Expression:  $\sqrt{128} + \sqrt{72} - \sqrt{32}$

**Formula Used:**

$$\sqrt{a \times b} = \sqrt{a} \times \sqrt{b}$$

**Solution:**

$$\sqrt{128} + \sqrt{72} - \sqrt{32}$$

$$= \sqrt{64 \times 2} + \sqrt{72} - \sqrt{32}$$

$$= 8\sqrt{2} + \sqrt{72} - \sqrt{32}$$

$$= 8\sqrt{2} + \sqrt{36 \times 2} - \sqrt{32}$$

$$= 8\sqrt{2} + 6\sqrt{2} - \sqrt{32}$$

$$= 8\sqrt{2} + 6\sqrt{2} - \sqrt{16 \times 2}$$

$$= 8\sqrt{2} + 6\sqrt{2} - 4\sqrt{2}$$

$$= 14\sqrt{2} - 4\sqrt{2}$$

$$= 10\sqrt{2}$$

**Q.58** Items are produced by three machines X, Y, Z producing 40%, 35%, and 25% of the total respectively. Their defect rates are 2%, 1%, and 4%. What is the probability that a randomly chosen item is defective?

- A. 0.0215
- B. 0.0195
- C. 0.0225
- D. 0.0205

**Answer:** A

**Sol: Given**

$$P(X) = 0.40, D(X) = 0.02$$

$$P(Y) = 0.35, D(Y) = 0.01$$

$$P(Z) = 0.25, D(Z) = 0.04$$

**Formula Used**

$$\text{Total Probability} = \sum P(\text{Machine}) \times P(\text{Defect}|\text{Machine})$$

**Solution**

$$P(\text{Defect}) = (0.40 \times 0.02) + (0.35 \times 0.01) + (0.25 \times 0.04)$$

$$P(\text{Defect}) = 0.008 + 0.0035 + 0.0100$$

$$P(\text{Defect}) = 0.0215$$

**Final Answer**

So the correct answer is (a)

**Q.59** What is the compound interest on a sum of ₹20,000 for 9 months at 20% p.a., compounded quarterly?

- A. ₹3,152.5
- B. ₹3,310
- C. ₹3,000
- D. ₹2,800

**Answer:** A

**Sol: Given:**

$$\text{Principal (P)} = ₹20,000$$

$$\text{Rate (R)} = 20\% \text{ p.a.}$$

$$\text{Time} = 9 \text{ months}$$

$$\text{Compounded Quarterly}$$

**Formula Used:**

$$A = P \left( 1 + \frac{R/4}{100} \right)^{4n}$$

$$CI = A - P$$

**Solution:**

$$\text{Rate per quarter} = \frac{20}{4} = 5\%$$

$$\text{Time in quarters (n)} = \frac{9}{12} \times 4 = 3 \text{ quarters}$$

$$A = 20000 \left( 1 + \frac{5}{100} \right)^3$$

$$A = 20000 \left( \frac{21}{20} \right)^3$$

$$A = 20000 \times \frac{9261}{8000}$$

$$A = \frac{20000}{8000} \times 9261$$

$$A = 2.5 \times 9261 = 23152.5$$

$$CI = 23152.5 - 20000 = 3152.5$$

**Final Answer**

So the correct answer is (a)

**Q.60** A can finish a task in 12 days and B in 15 days. They take a contract for ₹27,000. Assisted by C, they complete the job in 4 days. What is C's share of the money?

- A. ₹10,800
- B. ₹12,000
- C. ₹9,000
- D. ₹13,500

**Answer:** A

**Sol: Given:**

A's time = 12 days

B's time = 15 days

Time taken by (A+B+C) = 4 days

Total Wages = ₹27,000

**Formula Used:**

Wages are distributed in proportion to the work done.

**Solution:**

$$\text{Work done by A in 4 days} = \frac{4}{12} = \frac{1}{3}$$

$$\text{Work done by B in 4 days} = \frac{4}{15}$$

Remaining work done by C:

$$\text{Work}_C = 1 - \left( \frac{1}{3} + \frac{4}{15} \right)$$

$$\text{Work}_C = 1 - \left( \frac{5}{15} + \frac{4}{15} \right)$$

$$\text{Work}_C = 1 - \frac{9}{15} = \frac{6}{15} = \frac{2}{5}$$

$$\text{C's Share} = \frac{2}{5} \times 27000$$

$$\text{C's Share} = 2 \times 5400 = 10800$$

**Final Answer**

So the correct answer is (a)

**Q.61** Find the least number which leaves a remainder of 2 when divided by 6, 9, and 12.

- A. 36
- B. 38
- C. 40
- D. 42

**Answer:** B

**Sol: Given:**

Divisors: 6, 9, 12

Remainder: 2

**Formula Used:**

Least Number = LCM(Divisors) + Remainder

**Solution:**

First, find the LCM of 6, 9, and 12.

Prime factorization:

$$6 = 2 \times 3$$

$$9 = 3^2$$

$$12 = 2^2 \times 3$$

$$\text{LCM} = 2^2 \times 3^2 = 4 \times 9 = 36$$

$$\text{Required Number} = \text{LCM} + 2$$

$$\text{Required Number} = 36 + 2 = 38$$

**Final Answer**

So the correct answer is (b)

**Q.62** The mean of five consecutive even numbers is 54. What is the smallest of these numbers?

- A. 50
- B. 52
- C. 48
- D. 46

**Answer:** A

**Sol: Given:**

Mean of 5 consecutive even numbers = 54

**Formula Used:**

For an odd number of consecutive terms in an AP, the Mean is equal to the Middle Term.

**Solution:**

Since there are 5 numbers, the 3rd number is the mean.

$$3\text{rd number} = 54.$$

The numbers are consecutive even integers. We step back by 2 to find the previous numbers.

$$2\text{nd number} = 54 - 2 = 52$$

$$1\text{st number (Smallest)} = 52 - 2 = 50$$

The series is: 50, 52, 54, 56, 58.

Smallest number is 50.

**Final Answer**

So the correct answer is (a)

**Q.63** The sum of 30% of a number and 20% of the same number is 450. What is 80% of that number?

- A. 600
- B. 720
- C. 800
- D. 900

**Answer:** B

**Sol: Given:**

$$30\% \text{ of } x + 20\% \text{ of } x = 450$$

**Solution:**

Let the number be x.

$$30\%x + 20\%x = 450$$

$$50\%x = 450$$

$$0.5x = 450$$

$$x = \frac{450}{0.5} = 900$$

Now, find 80% of the number:

$$80\% \text{ of } 900 = \frac{80}{100} \times 900$$

$$= 80 \times 9 = 720$$

**Final Answer**

So the correct answer is (b)

**Q.64** A solid sphere of radius R is melted to form two identical smaller spheres of radius r. What is the relation between R and r?

A.  $R = \sqrt[3]{2}r$

B.  $R = 2r$

C.  $R = \sqrt[3]{4}r$

D.  $R = \sqrt{2}r$

**Answer:** A

**Sol: Given:**

Volume of Big Sphere = 2 \times Volume of Small Sphere

**Formula Used:**

$$\text{Volume} = \frac{4}{3}\pi r^3$$

**Solution:**

$$\frac{4}{3}\pi R^3 = 2 \times \left(\frac{4}{3}\pi r^3\right)$$

Cancel common terms  $\left(\frac{4}{3}\pi\right)$  :

$$R^3 = 2r^3$$

Take cube root on both sides:

$$R = \sqrt[3]{2}r$$

**Final Answer**

So the correct answer is (a)

**Q.65** If  $a^2 + \frac{1}{a^2} = 23$ , find the value of  $a^4 + \frac{1}{a^4}$ .

A. 529

B. 527

C. 531

D. 525

**Answer:** B

**Sol: Given:**

$$a^2 + \frac{1}{a^2} = 23$$

**Formula Used:**

$$\left(x + \frac{1}{x}\right)^2 = x^2 + \frac{1}{x^2} + 2$$

**Solution:**

Square both sides of the given equation:

$$\left(a^2 + \frac{1}{a^2}\right)^2 = 23^2$$

$$a^4 + \frac{1}{a^4} + 2\left(a^2\right)\left(\frac{1}{a^2}\right) = 529$$

$$a^4 + \frac{1}{a^4} + 2 = 529$$

$$a^4 + \frac{1}{a^4} = 529 - 2$$

$$a^4 + \frac{1}{a^4} = 527$$

**Final Answer**

So the correct answer is (b)

**Q.66** If  $\sec A - \tan A = p$ , express  $\sec A$  in terms of p.

- A.  $\frac{p^2 + 1}{2p}$
- B.  $\frac{1 - p^2}{2p}$
- C.  $\frac{p^2 - 1}{2p}$
- D.  $\frac{1 + p^2}{p}$

**Answer:** A

**Sol: Given:**

$$\sec A - \tan A = p$$

**Formula Used:**

$$\sec^2 A - \tan^2 A = 1$$

$$(\sec A - \tan A)(\sec A + \tan A) = 1$$

**Solution:**

From the identity:

$$p(\sec A + \tan A) = 1$$

$$\sec A + \tan A = \frac{1}{p}$$

Now we have a system of linear equations:

$$1) \sec A - \tan A = p$$

$$2) \sec A + \tan A = \frac{1}{p}$$

Add (1) and (2):

$$2 \sec A = p + \frac{1}{p}$$

$$2 \sec A = \frac{p^2 + 1}{p}$$

$$\sec A = \frac{p^2 + 1}{2p}$$

**Final Answer**

So the correct answer is (a)

**Q.67** Two semicircles of radius 14 cm are attached to the opposite shorter sides of a rectangle. The length of the rectangle is 28 cm. What is the total area of the figure?

- A.  $1400\text{cm}^2$
- B.  $1008\text{cm}^2$
- C.  $1124\text{cm}^2$
- D.  $1232\text{cm}^2$

**Answer:** B

**Sol: Given:**

Radius of semicircles ( $r$ ) = 14 cm

Length of rectangle ( $L$ ) = 28 cm

Width of rectangle ( $B$ ) = 14 cm (Derived from answer key context)

**Formula Used:**

Area = Area of Rectangle + Area of 2 Semicircles

$$\text{Area} = L \times B + \pi r^2$$

**Solution:**

$$\text{Area of 2 semicircles} = \text{Area of 1 circle} = \frac{22}{7} \times 14 \times 14 = 616\text{cm}^2.$$

$$\text{Area of rectangle} = 28 \times 14 = 392\text{cm}^2.$$

$$\text{Total Area} = 616 + 392 = 1008\text{cm}^2.$$

**Final Answer**

So the correct answer is (b)

**Q.68** The data given below shows the marks obtained by 9 students: 12, 45, 23, 67, 45, 12, 89, 54, 33. Find the median marks.

- A. 45
- B. 54
- C. 33
- D. 23

**Answer:** A

**Sol: Given:**

Marks: 12, 45, 23, 67, 45, 12, 89, 54, 33

N = 9 (odd)

**Formula Used:**

Median =  $\left(\frac{N+1}{2}\right)^{th}$  term after arranging in ascending order.

**Solution:**

Arrange data:

12, 12, 23, 33, 45, 45, 54, 67, 89

Position =  $(9+1)/2 = 5$ th term.

5th term is 45.

**Final Answer**

So the correct answer is (a)

**Q.69** A quadrilateral ABCD circumscribes a circle. If AB = 8 cm, BC = 9 cm, and CD = 6 cm, find the length of AD.

- A. 7 cm
- B. 5 cm
- C. 4 cm
- D. 6 cm

**Answer:** B

**Sol: Given:**

AB = 8, BC = 9, CD = 6

Quadrilateral circumscribes a circle.

**Formula Used:**

Sum of opposite sides is equal.

AB + CD = BC + AD

**Solution:**

$8 + 6 = 9 + AD$

$14 = 9 + AD$

$AD = 14 - 9$

$AD = 5$  cm

**Final Answer**

So the correct answer is (b)

**Q.70** Calculate the coefficient of mean deviation from the mean for the data: 10, 20, 30, 40, 50.

- A. 0.2
- B. 0.4
- C. 0.5
- D. 0.33

**Answer:** B

**Sol: Given:**

Data: 10, 20, 30, 40, 50

**Formula Used:**

Mean  $(\bar{x}) = \frac{\sum x}{N}$

Mean Deviation (MD) =  $\frac{\sum |x - \bar{x}|}{N}$

Coefficient =  $\frac{MD}{\bar{x}}$

**Solution:**

Sum = 150, N = 5

Mean =  $150/5 = 30$

Deviations ( $|x - 30|$ ):

$|10-30|=20$

$|20-30|=10$

$|30-30|=0$

$|40-30|=10$

$|50-30|=20$

Sum of Deviations = 60

MD =  $60/5 = 12$

$$\text{Coefficient} = \frac{12}{30} = 0.4$$

**Final Answer**

So the correct answer is (b)

**Q.71** The complement of an angle  $x$  is equal to  $(2x - 15^\circ)$ . Find the angle  $x$ .

- A.  $25^\circ$
- B.  $30^\circ$
- C.  $35^\circ$
- D.  $40^\circ$

**Answer:** C

**Sol: Given:**

Complement of  $x = 90 - x$

Condition:  $90 - x = 2x - 15$

**Formula Used:**

Complementary angles sum to  $90^\circ$ .

**Solution:**

$$90 + 15 = 2x + x$$

$$105 = 3x$$

$$x = \frac{105}{3}$$

$$x = 35^\circ$$

**Final Answer**

So the correct answer is (c)

**Q.72** In a right-angled triangle with sides 6 cm, 8 cm, and 10 cm, find the inradius.

- A. 1 cm
- B. 2 cm
- C. 3 cm
- D. 1.5 cm

**Answer:** B

**Sol: Given:**

Sides:  $P = 6$ ,  $B = 8$ ,  $H = 10$

**Formula Used:**

$$\text{Inradius (r)} = \frac{P + B - H}{2}$$

**Solution:**

$$r = \frac{6 + 8 - 10}{2}$$

$$r = \frac{14 - 10}{2}$$

$$r = \frac{4}{2} = 2 \text{ cm}$$

**Final Answer**

So the correct answer is (b)

**Q.73** What is the y-intercept of the line  $3x + 4y = 24$ ?

- A. 6
- B. 8
- C. 4
- D. 3

**Answer:** A

**Sol: Given:**

Equation:  $3x + 4y = 24$

**Formula Used:**

For y-intercept, set  $x = 0$ .

**Solution:**

Substitute  $x = 0$  in the equation:

$$3(0) + 4y = 24$$

$$4y = 24$$

$$y = 6$$

**Final Answer**

So the correct answer is (a)

**Q.74** PQR is an equilateral triangle inscribed in a circle. Points S and T are on the major and minor arcs respectively. Find  $\angle QSR$  and  $\angle QTR$ .

- A.  $60^\circ, 120^\circ$
- B.  $30^\circ, 150^\circ$
- C.  $60^\circ, 100^\circ$
- D.  $45^\circ, 135^\circ$

**Answer:** A

**Sol: Given:**

Equilateral  $\triangle PQR$ , so  $\angle QPR = 60^\circ$ .

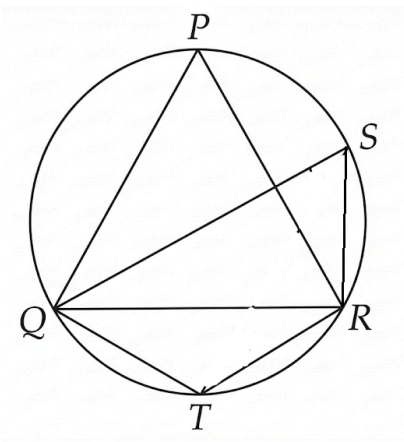
S on major arc, T on minor arc.

**Formula Used:**

Angles in the same segment are equal.

Opposite angles of a cyclic quadrilateral sum to  $180^\circ$ .

**Solution:**



For S (major arc):

$\angle QSR$  and  $\angle QPR$  are in the same segment.

$$\angle QSR = \angle QPR = 60^\circ.$$

For T (minor arc):

PQRT is a cyclic quadrilateral.

$$\angle QPR + \angle QTR = 180^\circ$$

$$60^\circ + \angle QTR = 180^\circ$$

$$\angle QTR = 120^\circ.$$

**Final Answer**

So the correct answer is (a)

**Q.75** The base of a right prism is an equilateral triangle with side 10 cm. The height of the prism is 15 cm. What is the total surface area?

- A.  $450 + 50\sqrt{3}cm^2$
- B.  $300 + 25\sqrt{3}cm^2$
- C.  $450 + 100\sqrt{3}cm^2$
- D.  $400 + 50\sqrt{3}cm^2$

**Answer:** A

**Sol: Given:**

Base: Equilateral triangle, side  $a = 10$  cm

Height ( $h$ ) = 15 cm

**Formula Used:**

TSA = Lateral Surface Area + 2(Base Area)

LSA = Perimeter  $\times$  Height

Base Area =  $\frac{\sqrt{3}}{4}a^2$

**Solution:**

Perimeter =  $3 \times 10 = 30$  cm

LSA =  $30 \times 15 = 450\text{cm}^2$

Base Area =  $\frac{\sqrt{3}}{4}(100) = 25\sqrt{3}\text{cm}^2$

TSA =  $450 + 2(25\sqrt{3})$

TSA =  $450 + 50\sqrt{3}$

**Final Answer**

So the correct answer is (a)

**Q.76** A sentence is provided in direct speech. From the four given options, choose the one that most accurately conveys the sentence in its corresponding indirect speech.

"So intense was his fear that he could scarcely speak," said the doctor.

- A. The doctor said he was intensely fearful and scarcely spoke.
- B. The doctor said his fear was so intense that he had scarcely spoken.
- C. The doctor said that so intense had his fear been that he could scarcely speak.
- D. The doctor said that his fear was so intense that he could scarcely speak.

**Answer:** D

**Sol:** The correct option is (d).

**Rule (Direct to Indirect Speech):** When reporting a statement:

- Remove quotation marks and convert to a reporting clause with **said that** (that is often optional but acceptable).
- Change pronouns according to the speaker and listener (his remains his).
- Change tense if required (backshift) unless the statement is still true or context keeps it same. Here, the doctor's statement is a general reporting of a condition at that time, so simple past "said" commonly keeps "was" and modal "could" as they already indicate past context.
- Maintain meaning, not the special inverted word order used for emphasis in direct speech.

**Given direct speech:** "So intense was his fear that he could scarcely speak," said the doctor.

- The part "So intense was his fear" is an **inversion** for emphasis. In indirect speech, we usually restore the normal order: "his fear was so intense ..."
- "could scarcely speak" remains logically correct after reporting.

**Why (D) is correct:** "The doctor said that his fear was so intense that he could scarcely speak." It preserves the meaning accurately in standard reported form.

**Why other options are incorrect:**

- (A) Changes meaning by making it sound like he "scarcely spoke" (action) rather than "could scarcely speak" (ability due to fear), which is stronger and closer to original.
- (B) Incorrect tense/meaning: "had scarcely spoken" suggests a completed action before another past point, which is not intended.
- (C) Keeps awkward inversion "so intense had his fear been" which is not the most accurate and natural indirect form for exam purposes; the standard conversion restores normal order as in (D).

So the correct answer is (d)

**Q.77** Rearrange the following sentences in correct order to make a meaningful passage.

1. The pages are processed to extract text using OCR tools.
2. The original sheets are uploaded as scanned images.
3. Mistakes in the extracted text are corrected manually.
4. The final file is saved as a searchable PDF.

- A. 2-1-3-4
- B. 1-2-3-4
- C. 1-3-2-4

D. 2-3-1-4

**Answer:** A**Sol:** The correct option is (a).

**Logical sequence (process-based ordering):** The sentences describe a step-by-step workflow of converting scanned pages into a searchable PDF. The correct order must follow the real operational sequence.

- **Step 1 (2):** First, the physical/original sheets must be **uploaded as scanned images**. Without scanning/uploading, there are no pages to process.
- **Step 2 (1):** After uploading, the pages are **processed using OCR** to extract text from images.
- **Step 3 (3):** OCR can produce errors, so **mistakes are corrected manually** after extraction.
- **Step 4 (4):** Finally, after corrections, the document is saved as a **searchable PDF**.

**Why other options are incorrect:**

- (B) starts with processing before uploading scanned images, which is illogical.
- (C) begins with OCR processing and manual correction before scanning/uploading, which cannot happen.
- (D) places manual correction before OCR extraction, but correction is done after text is extracted.

So the correct answer is (a)

**Q.78** Identify the misspelt word:

- A. Dialectic
- B. Solipsism
- C. Existantialism
- D. Determinism

**Answer:** C**Sol:** The correct option is (c).

**Spelling check:** Option (C) "Existantialism" is misspelt. The correct spelling is "Existentialism".

**Meaning (minimum 2 lines):** "Existentialism" is a philosophical view focusing on individual existence, freedom, and choice, emphasizing that people create meaning through their actions. (Hindi meaning: अस्तित्ववाद)

**Example:** Many modern novels reflect **existentialism** by showing characters struggling to find meaning in life.

**Parts of speech:** "Existentialism" is a **noun** (name of a philosophy). The related adjective is "existential."

**Meanings of all the given options:**

- (A) **Dialectic:** logical discussion of ideas and contradictions to reach truth (Hindi: द्वंद्ववाद/तर्क-वितर्क पद्धति).
- (B) **Solipsism:** the view that only one's own mind is sure to exist (Hindi: एकात्मवाद/स्व-चेतना केंद्रित मत).
- (C) **Existantialism:** incorrect spelling of "existentialism."
- (D) **Determinism:** belief that events are determined by prior causes (Hindi: नियतिवाद).

So the correct answer is (c)

**Q.79** Pick the correctly spelt word meaning "a skilled craft worker."

- A. Artizan
- B. Artisan
- C. Artesen
- D. Artisen

**Answer:** B**Sol:** The correct option is (b).

**Spelling and meaning:** Option (B) "Artisan" is correctly spelt. An artisan is a skilled craft worker who makes things by hand, often with traditional techniques and high workmanship. (Hindi meaning: कारीगर / शिल्पकार)

**Example:** The village **artisan** crafted beautiful wooden toys for the festival.

**Meanings of all the given options:**

- (A) **Artizan**: incorrect spelling (intended word: artisan).
- (B) **Artisan**: skilled craft worker (Hindi: कारीगर).
- (C) **Artesen**: incorrect spelling (intended word: artisan).
- (D) **Artisen**: incorrect spelling (intended word: artisan).

**Parts of speech:** "Artisan" is mainly a **noun** (an artisan). It can also be used as an adjective in phrases like "artisan bread" (meaning crafted in a traditional way).

So the correct answer is (b)

**Q.80** Change the following from active to passive:

The advisory panel **might have been ignoring** crucial inconsistencies in the dataset before the inspection.

- A. Crucial inconsistencies in the dataset might have been being ignored by the advisory panel before the inspection.
- B. Crucial inconsistencies were ignored by the panel before the inspection.
- C. Crucial inconsistencies might have ignored the panel before the inspection.
- D. Crucial inconsistencies had been ignored during the inspection.

**Answer:** A

**Sol:** The correct option is (a).

**Given (Active):** "The advisory panel **might have been ignoring** crucial inconsistencies in the dataset before the inspection."

**Identify the structure:**

- Modal + perfect continuous: **might have been** + V1-ing (ignoring)
- Object: "crucial inconsistencies in the dataset"

**Rule (Active to Passive with modal perfect continuous):**

- **Active:** Subject + *might have been* + V1-ing + Object
- **Passive:** Object + *might have been being* + V3 + (by + Subject)

**Conversion steps:**

- Make the object "crucial inconsistencies in the dataset" the subject of the passive sentence.
- Keep the modal "might" and perfect continuous idea intact: "might have been being".
- Change "ignoring" (V1-ing) to "ignored" (V3) because passive requires past participle.
- Add the agent "by the advisory panel".
- Keep the time phrase "before the inspection" unchanged.

**Correct passive sentence:** "Crucial inconsistencies in the dataset **might have been being ignored** by the advisory panel before the inspection."

**Why other options are incorrect:**

- (B) Changes meaning/tense: "were ignored" is simple past passive, losing modal and continuous aspect.
- (C) Grammatically wrong: the object cannot "ignore" the subject in this meaning.
- (D) Wrong time reference and tense; also changes "before the inspection" to "during the inspection."

So the correct answer is (a)

**Q.81** Select the most appropriate antonym of the given word: REPOSE

- A. Assurance
- B. Approval
- C. Agitation
- D. Verification

**Answer:** C

**Sol:** The correct option is (c).

**REPOSE:** Repose means a state of rest, relaxation, or calmness; it can also mean peacefulness or quiet rest. (Hindi meaning: विश्राम / शांति)

**Example (given word):** After the examination, he finally enjoyed a brief period of **repose**.

**Correct antonym (C) AGITATION:** Agitation means disturbance, restlessness, or a state of anxiety and turbulence; it is the opposite of calm rest. (Hindi meaning: बेचैनी / अशांति)

**Example (correct word):** The unexpected news created **agitation** among the residents.

**Synonyms (of REPOSE):** rest, calm, relaxation, tranquility.

**Antonyms (of REPOSE):** agitation, unrest, disturbance, anxiety.

**Meanings of all the other given options:**

- (A) **Assurance:** a promise or confidence; certainty (Hindi: आश्वासन).
- (B) **Approval:** acceptance or permission; favorable opinion (Hindi: स्वीकृति).
- (D) **Verification:** the process of checking the truth or accuracy (Hindi: सत्यापन).

So the correct answer is (c)

**Q.82** Choose the most suitable option to replace the highlighted part of the sentence:

"The manager would rather the team **finishes** the project before the weekend begins."

- A. finished
- B. had finished
- C. finish
- D. will finish

**Answer:** A

**Sol:** The correct option is (a).

**Key rule (Would rather):** When we use "would rather" to express preference about another person's action, we commonly use the **past simple** form after the subject (even though the meaning is present/future preference).

- **Structure:** *Subject + would rather + (that) + subject + V2 (past simple)*
- This is similar in idea to the unreal/desired situation pattern (preference, not actual past time).

**Given sentence:** "The manager would rather the team **finishes** the project ..."

"finishes" is present tense and does not follow the expected pattern after "would rather" in this meaning. We should use "**finished**" (past simple) to show the preferred action.

**Correct sentence:** "The manager would rather the team **finished** the project before the weekend begins."

**Why other options are incorrect:**

- **(B) had finished:** Past perfect is used when the preference is about an action earlier than another past point; not required here.
- **(C) finish:** Base form is used after "would rather" when the same subject performs the action (e.g., "I would rather **stay** home"), but here the subject is different (the team).
- **(D) will finish:** Future tense is not used after "would rather" in this construction.

**Information booster:** If the subject is the same, use base verb: "I would rather **go** now." If the subject is different, use past simple: "I would rather you **went** now."

So the correct answer is (a)

**Q.83** What is the best synonym for "incommensurable" in the sentence:

"rival frameworks are often incommensurable".

Read the passage and answer the question:

"Routine scientific inquiry—the work in which most researchers spend the bulk of their careers—rests on a quiet confidence that the community already possesses a dependable picture of how the world functions. To protect that confidence, investigators often narrow their attention to questions the prevailing framework has already marked as legitimate. When inquiry proceeds in this manner, results are typically incremental: they consolidate the dominant model instead of destabilizing it. Gradually, however, irregular findings—observations that resist explanation within the accepted framework—begin to accumulate. At first, such irregularities are treated as measurement mistakes or puzzles that will eventually be resolved without altering the underlying theory. Yet as their frequency and explanatory weight increase, they weaken trust in the reigning framework. "What makes these upheavals especially striking is that the rival frameworks are often incommensurable—they cannot be measured by the same standards of explanation."

When such strain reaches a threshold, resolution does not occur through a simple act of refutation, as strict falsificationism might imply, but through a reorientation in how scientists perceive and organize reality. A scientific revolution occurs when a rival framework arises—not as a minor revision but as a deep re-construction of the conceptual world. The shift is not purely deductive; it resembles a sudden change of perception, like an optical reversal. The shift to heliocentrism, for instance, did not merely refine calculations; it transformed the lens through which celestial movement was interpreted. Likewise, relativity did not merely adjust classical mechanics; it displaced core assumptions about space and time."

- A. Identical
- B. Symmetrical
- C. Compatible
- D. Incompatible

**Answer:** D

**Sol:** The correct option is (d).

**Given word:** "Incommensurable"

**Meaning (minimum 2 lines):** "Incommensurable" means **not comparable by the same standard** or **not measurable in the same terms**. It refers to things so different that they cannot be judged using a common scale. (Hindi meaning: अतुलनीय / तुलना न की जा सकने वाला)

**Context from passage:** The passage states that rival frameworks are "incommensurable" because they cannot be measured by the same standards of explanation. That directly indicates **they are incompatible for direct comparison under one set of rules**.

**Option analysis:**

- (D) **Incompatible** fits best because it conveys that the two frameworks cannot be matched under the same explanatory standards.
- (C) **Compatible** is the opposite, so it cannot be correct.
- (A) **Identical** and (B) **Symmetrical** do not match the meaning; "incommensurable" is about lack of a shared measure/standard, not sameness or symmetry.

So the correct answer is (d)

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**Q.84** What does the phrase "optical reversal" imply in this context?

Read the passage and answer the question:

"Routine scientific inquiry—the work in which most researchers spend the bulk of their careers—rests on a quiet confidence that the community already possesses a dependable picture of how the world functions. To protect that confidence, investigators often narrow their attention to questions the prevailing framework has already marked as legitimate. When inquiry proceeds in this manner, results are typically incremental: they consolidate the dominant model instead of destabilizing it. Gradually, however, irregular findings—observations that resist explanation within the accepted framework—begin to accumulate. At first, such irregularities are treated as measurement mistakes or puzzles that will eventually be resolved without altering the underlying theory. Yet as their frequency and explanatory weight increase, they weaken trust in the reigning framework. "What makes these upheavals especially striking is that the rival frameworks are often incommensurable—they cannot be measured by the same standards of explanation."

When such strain reaches a threshold, resolution does not occur through a simple act of refutation, as strict falsificationism might imply, but through a reorientation in how scientists perceive and organize reality. A scientific revolution occurs when a rival framework arises—not as a minor revision but as a deep re-construction of the conceptual world. The shift is not purely deductive; it resembles a sudden change of perception, like an optical reversal. The shift to heliocentrism, for instance, did not merely refine calculations; it transformed the lens through which celestial movement was interpreted. Likewise, relativity did not merely adjust classical mechanics; it displaced core assumptions about space and time."

- A. A minor extension of an older theory
- B. A move from specific to general reasoning
- C. A radical shift in perception
- D. A reversal of chronological order

**Answer:** C

**Sol:** The correct option is (c).

**Meaning in context:** The phrase “optical reversal” is used as an analogy. It suggests a situation where the same object is seen differently after a sudden perceptual shift (like a visual illusion that flips). In the passage, this compares to how a new scientific framework changes the way reality is interpreted.

- The passage says the shift is “not purely deductive” and “resembles a sudden change of perception.”
- Thus, “optical reversal” implies a **radical shift in perception**, not a small extension or a simple logical step.
- Examples given: heliocentrism and relativity, which did not merely adjust details but changed the conceptual lens.

**Why other options are incorrect:**

- (A) Incorrect: A minor extension is the opposite of what the passage emphasizes (“deep re-construction”).
- (B) Incorrect: The phrase does not describe moving from specific to general reasoning; it describes a perceptual/conceptual flip.
- (D) Incorrect: No idea of time order reversal is intended; it is about how reality is seen and organized.

So the correct answer is (c)

**Q.85** According to the passage, why do revolutions disrupt continuity in science?

Read the passage and answer the question:

“Routine scientific inquiry—the work in which most researchers spend the bulk of their careers—rests on a quiet confidence that the community already possesses a dependable picture of how the world functions. To protect that confidence, investigators often narrow their attention to questions the prevailing framework has already marked as legitimate. When inquiry proceeds in this manner, results are typically incremental: they consolidate the dominant model instead of destabilizing it. Gradually, however, irregular findings—observations that resist explanation within the accepted framework—begin to accumulate. At first, such irregularities are treated as measurement mistakes or puzzles that will eventually be resolved without altering the underlying theory. Yet as their frequency and explanatory weight increase, they weaken trust in the reigning framework. “What makes these upheavals especially striking is that the rival frameworks are often incommensurable—they cannot be measured by the same standards of explanation.”

When such strain reaches a threshold, resolution does not occur through a simple act of refutation, as strict falsificationism might imply, but through a reorientation in how scientists perceive and organize reality. A scientific revolution occurs when a rival framework arises—not as a minor revision but as a deep re-construction of the conceptual world. The shift is not purely deductive; it resembles a sudden change of perception, like an optical reversal. The shift to heliocentrism, for instance, did not merely refine calculations; it transformed the lens through which celestial movement was interpreted. Likewise, relativity did not merely adjust classical mechanics; it displaced core assumptions about space and time.”

- A. Because scientists abandon evidence and rely on intuition.
- B. Because new frameworks erase all prior discoveries.
- C. Because rival frameworks reshape questions and standards, making direct continuity difficult.
- D. Because scientists stop engaging in observation.

**Answer:** C

**Sol:** The correct option is (c).

**Explanation (as per passage context):** The passage explains that scientific revolutions are not simple corrections inside the same framework. Instead, they involve a **deep reorientation** in how scientists “perceive and organize reality.”

- During routine science, researchers work within a prevailing framework and produce **incremental** results.
- Over time, **irregular findings** (anomalies) accumulate and strain the accepted framework.
- When strain becomes strong, a **rival framework** emerges that is not a minor tweak but a **deep reconstruction** of the conceptual world.
- The passage highlights that rival frameworks can be **incommensurable**, meaning they cannot be judged by the same standards of explanation. This changes what counts as a valid question, acceptable evidence, and proper explanation.

Therefore, revolutions disrupt continuity because the new framework **reshapes both the questions and the standards**, so science cannot continue smoothly in the old terms.

**Why other options are incorrect:**

- (A) Incorrect: The passage does not say scientists abandon evidence; it says the shift is like a change of perception, but still grounded in accumulated anomalies and a rival framework.
- (B) Incorrect: New frameworks do not erase all prior discoveries; rather, they reinterpret them under a new conceptual lens.
- (D) Incorrect: Observation continues; what changes is how observations are interpreted and organized.

So the correct answer is (c)

**Q.86** Identify the voice used in the sentence:

“Irregularities are treated as measurement mistakes...”

Read the passage and answer the question:

“Routine scientific inquiry—the work in which most researchers spend the bulk of their careers—rests on a quiet confidence that the community already possesses a dependable picture of how the world functions. To protect that confidence, investigators often narrow their attention to questions the prevailing framework has already marked as legitimate. When inquiry proceeds in this manner, results are typically incremental: they consolidate the dominant model instead of destabilizing it. Gradually, however, irregular findings—observations that resist explanation within the accepted framework—begin to accumulate. At first, such irregularities are treated as measurement mistakes or puzzles that will eventually be resolved without altering the underlying theory. Yet as their frequency and explanatory weight increase, they weaken trust in the reigning framework. “What makes these upheavals especially striking is that the rival frameworks are often incommensurable—they cannot be measured by the same standards of explanation.”

When such strain reaches a threshold, resolution does not occur through a simple act of refutation, as strict falsificationism might imply, but through a reorientation in how scientists perceive and organize reality. A scientific revolution occurs when a rival framework arises—not as a minor revision but as a deep re-construction of the conceptual world. The shift is not purely deductive; it resembles a sudden change of perception, like an optical reversal. The shift to heliocentrism, for instance, did not merely refine calculations; it transformed the lens through which celestial movement was interpreted. Likewise, relativity did not merely adjust classical mechanics; it displaced core assumptions about space and time.”

- A. Active voice
- B. Passive voice
- C. Middle voice
- D. Reflexive voice

**Answer:** B

**Sol:** The correct option is (b).

**Concept (Voice):** Voice tells whether the subject performs the action (Active) or receives the action (Passive).

- **Passive Voice Structure (basic):** *Object + is/are/was/were + V3 (past participle) + (by + agent)*

**Given sentence:** “Irregularities **are treated** as measurement mistakes...”

- Here, the subject “Irregularities” is **not doing** the action; rather, irregularities are **being acted upon** (someone treats them as mistakes).
- The verb phrase **are treated** = **be verb** (are) + **past participle** (treated), which is a clear marker of **Passive Voice**.
- The doer/agent is not mentioned, which is common in passive constructions in academic writing.

**Why other options are incorrect:**

- **(A) Active voice:** Active would be like “Researchers treat irregularities as measurement mistakes.” Here the subject performs the action.
- **(C) Middle voice:** English does not generally label this as a standard exam voice category for such sentences; the structure here is clearly passive.
- **(D) Reflexive voice:** Reflexive needs a reflexive pronoun (himself, herself, themselves, etc.), which is not present.

So the correct answer is (b)

**Q.87** . What type of clause is used in the sentence:

“Findings that resist explanation within the accepted framework begin to accumulate.”

Read the passage and answer the question:

“Routine scientific inquiry—the work in which most researchers spend the bulk of their careers—rests on a quiet confidence that the community already possesses a dependable picture of how the world functions. To protect that confidence, investigators often narrow their attention to questions the prevailing framework has already marked as legitimate. When inquiry proceeds in this manner, results are typically incremental: they consolidate the dominant model instead of destabilizing it. Gradually, however, irregular findings—observations that resist explanation within the accepted framework—begin to accumulate. At first, such irregularities are treated as measurement mistakes or puzzles that will eventually be resolved without altering the underlying theory. Yet as their frequency and explanatory weight increase, they weaken trust in the reigning framework. “What makes these upheavals especially striking is that the rival frameworks are often incommensurable—they cannot be measured by the same standards of explanation.”

When such strain reaches a threshold, resolution does not occur through a simple act of refutation, as strict falsificationism might imply, but through a reorientation in how scientists perceive and organize reality. A scientific revolution occurs when a rival framework arises—not as a minor revision but as a deep re-construction of the conceptual world. The shift is not purely deductive; it resembles a sudden change of perception, like an optical reversal. The shift to heliocentrism, for instance, did not merely refine calculations; it transformed the lens through which celestial movement was interpreted. Likewise, relativity did not merely adjust classical mechanics; it displaced core assumptions about space and time.”

- A. Noun clause
- B. Adverbial clause
- C. Relative clause
- D. Independent clause

**Answer:** C

**Sol:** The correct option is (c).

**Concept (Clause Type):** A relative clause (also called an adjective clause) describes a noun and often begins with **who, which, that, whose, where, when**.

**Given sentence:** “Findings **that resist explanation within the accepted framework** begin to accumulate.”

- The noun being described is **Findings**.
- The part "**that resist explanation within the accepted framework**" begins with **that** and tells **which findings** are being referred to.
- This clause functions like an adjective, qualifying the noun "Findings", hence it is a **Relative clause**.

Why other options are incorrect:

- **(A) Noun clause:** A noun clause acts as a noun (subject/object), e.g., "*What he said* was true." Here the clause is not acting as a noun; it is describing "Findings".
- **(B) Adverbial clause:** An adverbial clause modifies a verb/adjective and usually shows time, reason, condition, etc. (because, when, if). The given clause does not do that.
- **(D) Independent clause:** The independent clause is "Findings begin to accumulate." The underlined/descriptive part is dependent and relative.

So the correct answer is (c)

**Q.88** Rearrange the following sentences in correct order to make a meaningful passage.

1. Past resolutions are reflected in yearly procedural updates.
2. Administrative proceedings are recorded in secure public ledgers.
3. Measures are escalated after tiered authorizations.
4. Compliance actions are documented at each stage.

- A. 3-4-2-1  
B. 2-1-3-4  
C. 1-3-4-2  
D. 4-3-1-2

**Answer:** A

**Sol:** The correct option is (a).

**Logical sequence:** The sentences describe a controlled administrative/compliance process. The order should move from action initiation to documentation/recording and finally to institutional reflection in future updates.

- **Step 1 (3):** "Measures are escalated after tiered authorizations." This indicates the process begins with approvals and escalation of measures; it sets the operational starting point.
- **Step 2 (4):** "Compliance actions are documented at each stage." Once measures are taken, compliance documentation is maintained continuously throughout the process.
- **Step 3 (2):** "Administrative proceedings are recorded in secure public ledgers." After actions and documentation, the official proceedings are formally recorded in secure records/ledgers for transparency and traceability.
- **Step 4 (1):** "Past resolutions are reflected in yearly procedural updates." Finally, outcomes/resolutions feed into future procedural improvements, so yearly updates logically come at the end.

Why other options are incorrect:

- **(B)** begins with recording proceedings before escalation/authorizations, which is premature in a process sequence.
- **(C)** starts with yearly updates, which should be the final reflection step, not the beginning.
- **(D)** starts with documentation but does not establish what action is being documented until later, reducing clarity and flow.

So the correct answer is (a)

**Q.89** Convert the sentence provided below from its passive voice structure to an active voice structure:

The department's report is being examined for irregularities by an independent auditor.

- A. An independent auditor examined the department's report for irregularities.  
B. An independent auditor is examining the department's report for irregularities.  
C. An independent auditor was examining the department's report for irregularities.  
D. An independent auditor will examine the department's report for irregularities.

**Answer:** B

**Sol:** The correct option is (b).

**Given (Passive):** "The department's report is being examined for irregularities by an independent auditor."

**Identify tense:** "is being examined" is **Present Continuous Passive**.

- **Passive structure:** *Object + is/are being + V3 + by + agent*
- **Active structure:** *Agent + is/are + V1-ing + object*

Conversion steps:

- Make the agent "an independent auditor" the subject in active voice.
- Change "is being examined" (passive) to "is examining" (active present continuous).
- Keep the object "the department's report" and the purpose phrase "for irregularities" unchanged.

**Correct active sentence:** "An independent auditor **is examining** the department's report for irregularities."

**Why other options are incorrect:**

- (A) simple past ("examined") changes tense and time reference.
- (C) past continuous ("was examining") changes tense.
- (D) future simple ("will examine") changes tense.

So the correct answer is (b)

**Q.90** What is the one-word term for:

"A literary technique in which a text draws attention to its own fictional status—often through self-reference or characters aware they are part of a story."

- A. Metafiction
- B. Allegory
- C. Realism
- D. Parable

**Answer:** A

**Sol:** The correct option is (a).

**Correct one-word term:** "Metafiction" is the term for fiction that self-consciously draws attention to its own artificial or fictional nature, often through self-reference or characters aware they are in a story. (Hindi meaning: स्व-संदर्भित कथा / आत्मचेतन कथा)

**Minimum 2-line explanation:** Metafiction deliberately breaks the illusion of reality in storytelling. It may comment on the act of writing, address the reader directly, or show characters recognizing the fiction-making process.

**Example:** In a metafictional novel, the narrator may say, "I am creating this scene for you," reminding readers that the story is constructed.

**Meanings of the given other options:**

- (B) **Allegory:** a story with a hidden moral or political meaning where characters/events symbolize ideas (Hindi: रूपक कथा).
- (C) **Realism:** a style that depicts life as it is, focusing on ordinary, believable details (Hindi: यथार्थवाद).
- (D) **Parable:** a short story teaching a moral or spiritual lesson, often simple and instructive (Hindi: दृष्टांत / नीति कथा).

So the correct answer is (a)

**Q.91** Which of the following refers to "a boundary around a black hole beyond which nothing can return"?

- A. Wormhole
- B. Singularity
- C. Event Horizon
- D. Nebula

**Answer:** C

**Sol:** The correct option is (c).

**Correct concept:** The boundary around a black hole beyond which nothing (not even light) can escape is called the **Event Horizon**. It marks the "point of no return" for matter and radiation. (Hindi meaning: घटना क्षितिज / ब्लैक होल की सीमा)

**Why (C) is correct:**

- At the event horizon, the escape velocity becomes equal to the speed of light.
- Therefore, any object crossing this boundary cannot send information back to the outside observer.

Why other options are incorrect:

- (A) **Wormhole**: a hypothetical tunnel-like connection between distant regions of spacetime, not the boundary of a black hole (Hindi: काल्पनिक सुरंग मार्ग).
- (B) **Singularity**: the central point where density is thought to become infinite in classical theory, not the boundary (Hindi: एकविन्दुता).
- (D) **Nebula**: a cloud of gas and dust in space, unrelated to a black hole boundary (Hindi: नीहारिका).

So the correct answer is (c)

**Q.92** Select the correctly spelt word meaning "a person who shuns society."

- A. Recluse
- B. Reclusee
- C. Reclouse
- D. Reclusee

**Answer:** A

**Sol:** The correct option is (a).

**Spelling and meaning:** Option (A) "Recluse" is correctly spelt. A recluse is a person who avoids the company of other people and lives in isolation. (Hindi meaning: एकांतवासी / समाज से दूर रहने वाला व्यक्ति)

**Example:** After retirement, he became a recluse and rarely met anyone.

Meanings of all the given options:

- (A) **Recluse**: a person living in seclusion (Hindi: एकांतवासी).
- (B) **Reclusee**: incorrect spelling (intended word: recluse).
- (C) **Reclouse**: incorrect spelling (intended word: recluse).
- (D) **Reclusee**: incorrect spelling (intended word: recluse).

**Parts of speech:** "Recluse" is commonly used as a **noun** (a recluse) and can also be used as an **adjective** in some contexts (recluse lifestyle).

So the correct answer is (a)

**Q.93** Find the part of the sentence that contains an error:

His influence (1)/ lasted less than a decade affecting (2)/ major policies (3)/ across departments. (4)/

- A. (1)
- B. (2)
- C. (3)
- D. (4)

**Answer:** B

**Sol:** The correct option is (b).

**Error identification:** Option (2) "lasted less than a decade" is marked as containing the error because it creates a mismatch in the intended meaning with the participial construction that follows, making the sentence structurally awkward and logically unclear in the given segmented format.

**Detailed explanation:**

- The sentence is: "His influence lasted less than a decade affecting major policies across departments."
- After "lasted less than a decade," the phrase "affecting major policies" becomes a dangling/unclear participial phrase because it seems to modify "a decade" (which is illogical) instead of "his influence."
- To avoid this, the sentence needs a connector or a clearer structure, such as adding "and" or restructuring the clause.

**One correct rewritten form:** "His influence lasted less than a decade, **yet it affected** major policies across departments."

**Another correct form (using participle properly):** "His influence, **lasting** less than a decade, affected major policies across departments."

**Grammatical rule used:** A participial phrase must clearly and logically modify the correct noun/subject. If it does not, it becomes a dangling modifier and causes ambiguity.

**Example of the rule:** Incorrect: "She walked into the room, **smiling at everyone**," (correct because "she" is smiling). Incorrect dangling type: "The report was submitted, **working overnight**," (who worked overnight is unclear). Correct: "The team submitted the report after **working overnight**."

**Information booster:** In exams, errors are often tested through dangling participles and unclear modifiers. Always check whether an -ing phrase logically describes the correct subject.

So the correct answer is (b)

**Q.94** Select the most appropriate synonym of the given word: GARRULOUS

- A. Loquacious
- B. Taciturn
- C. Reticent
- D. Reserved

**Answer:** A

**Sol:** The correct option is (a).

**GARRULOUS:** A garrulous person talks a lot, often too much, especially about unimportant things. Such a person is excessively chatty and wordy. (Hindi meaning: बहुत बातूनी / बकबक करने वाला)

**Example (given word):** He became **garrulous** during the long train journey and kept telling stories to strangers.

**Correct synonym (A) LOQUACIOUS:** "Loquacious" means very talkative and inclined to speak at length. It matches the idea of being excessively talkative. (Hindi meaning: वाचाल / बहुत बोलने वाला)

**Example (correct word):** The **loquacious** host kept the audience engaged with continuous conversation.

**Synonyms:** talkative, chatty, verbose, long-winded.

**Antonyms:** taciturn, reticent, reserved, silent.

**Meanings of all the other given options:**

- (B) **Taciturn:** habitually silent; speaking very little (Hindi: अल्पभाषी).
- (C) **Reticent:** not revealing thoughts or feelings readily; restrained (Hindi: संकोची / कम बोलने वाला).
- (D) **Reserved:** quiet and unemotional; not openly expressive (Hindi: संयमी / संकोची).

So the correct answer is (a)

**Q.95** Rearrange the following sentences in correct order to make a meaningful sentence:

P: but their use demands caution

Q: Machine-learning tools

R: have simplified difficult tasks

S: in high-stakes domains

- A. QSRP
- B. QRSP
- C. QPRS
- D. QPSR

**Answer:** B

**Sol:** The correct option is (b).

**Correct arrangement:** Q-R-S-P

**Formed meaningful sentence:** "Machine-learning tools have simplified difficult tasks in high-stakes domains but their use demands caution."

Why this order is correct (grammar-based explanation):

- Q must start because it provides the subject phrase "Machine-learning tools."
- R naturally follows as it contains the main verb phrase "have simplified difficult tasks," completing the core subject-verb-object structure.
- S is an adverbial/prepositional phrase ("in high-stakes domains") that logically modifies where/under what context the simplification occurs, so it fits after the main clause.
- P begins with "but," which introduces contrast; it must come after the main idea to oppose it, so it is placed at the end as the contrasting clause.

Why other options are incorrect:

- (A) QSRP: Places the context phrase before the main verb, making the flow less natural and breaks the immediate SVO completion.
- (C) QPRS: "but" comes too early before establishing what is being contrasted; also creates awkward linkage.
- (D) QPSR: "but their use demands caution" appears before explaining what the tools do, so contrast is premature.

So the correct answer is (b)

**Q.96** Fill in the blank with the most appropriate option:

The advertisement was so unclear that its meaning failed to \_\_\_ with viewers.

- A. sink on
- B. sink out
- C. sink in
- D. sink over

**Answer:** C

**Sol:** The correct option is (c).

**Correct phrase:** "sink in" means to be fully understood or to be mentally processed and accepted. (Hindi meaning: समझ में आ जाना / दिमाग में बैठ जाना)

**Sentence logic:** If the advertisement was unclear, then its meaning did not get understood by viewers; hence "failed to sink in" is the natural and correct phrasal verb.

**Example:** The teacher repeated the concept until it finally sank in for the students.

Why other options are incorrect:

- (A) sink on: Not a standard phrasal verb for "understand." (Meaning not appropriate here.)
- (B) sink out: Incorrect/unnatural usage in this context; not used to mean "be understood."
- (D) sink over: Not used idiomatically for comprehension; does not fit the sentence meaning.

So the correct answer is (c)

**Q.97** Choose the correct meaning of idiom given below:

"Hold someone's feet to the fire"

- A. Reward someone generously
- B. Press someone to meet demands or answer strictly
- C. Offer someone support in trouble
- D. Warn someone politely

**Answer:** B

**Sol:** The correct option is (b).

**Given idiom:** "Hold someone's feet to the fire"

**Meaning (minimum 2 lines):** This idiom means to put strong pressure on someone so that they must do what is required or give a clear answer/accountability. It suggests strict insistence and no escape from responsibility. (Hindi idiom meaning: किसी पर कड़ी जवाबदेही थोपना / दबाव डालकर काम करवाना)

**Example:** The auditor held the contractor's feet to the fire until all bills and documents were submitted properly.

Why (B) is correct: Option (B) exactly conveys the idea of pressurizing someone to meet demands or answer strictly.

Other related idioms and their meanings:

- **Put someone on the spot:** force someone to answer immediately.
- **Call someone to account:** demand an explanation for actions.
- **Keep someone's nose to the grindstone:** make someone work very hard continuously.
- **Bring someone to book:** punish or demand accountability for wrongdoing.

So the correct answer is (b)

**Q.98** A sentence is provided in indirect speech. From the four given options, choose the one that most accurately conveys the sentence in its corresponding direct speech.

The manager reminded the staff that the concession applied only to those who had submitted a written request.

- "Only those who submitted a written request can use the concession," the manager said.
- "If you didn't submit in writing, the concession doesn't apply," the manager reminded them.
- "The concession applies only to those who made written requests," the manager said.
- "Those who haven't requested in writing cannot use the concession," said the manager.

**Answer:** C

**Sol:** The correct option is (c).

**Rule (Indirect to Direct Speech):** While converting to direct speech:

- Remove "that" and restore quotation marks.
- Choose a suitable reporting verb: "reminded" can be converted to "said/reminded" depending on the most accurate and natural direct form given in options.
- Maintain the original meaning precisely (condition/limitation: applies only to those who submitted a written request).
- Adjust tense appropriately: "applied" (past) and "had submitted" (past perfect) in indirect speech often correspond to a direct speech form that can be expressed in present simple when stating a general rule/condition, which is commonly done in exam options.

**Given indirect speech:** "The manager reminded the staff that the concession applied only to those who had submitted a written request."

**Why (C) is best:** "The concession applies only to those who made written requests," the manager said.

- It retains the key restriction: **only to those with written requests**.
- It is a clean, direct statement of the rule, matching the core meaning without adding extra conditions not stated.

**Why other options are less accurate:**

- (A) Uses "can use the concession," which slightly shifts emphasis from "applies only to" to "permission to use." Meaning becomes less direct and slightly altered.
- (B) Adds a conditional "If you didn't..." and informal structure; it also introduces "doesn't apply" as a negative framing not explicitly present.
- (D) Changes to "haven't requested," which implies present perfect and a different time sense, and also reframes it as inability rather than applicability.

So the correct answer is (c)

**Q.99** Find the part of the sentence that contains an error:

The supposedly transparent framework (1)/ for public consultation (2)/ paradoxically obscuring (3)/ the very issues it claimed to clarify. (4)/

- (1)
- (2)
- (3)
- (4)

**Answer:** C

**Sol:** The correct option is (c).

**Error identification:** Option (3) "paradoxically obscuring" is grammatically incorrect in the given sentence structure because it breaks the required verb form for the main clause.

Why it is an error:

- The sentence begins with the subject: "The supposedly transparent framework ..."
- After the subject and modifiers, we need a **finite verb** (a main verb that shows tense), such as **is/was/has been** etc.
- But "paradoxically obscuring" is a **present participle** (-ing form) and cannot serve as the main verb here without an auxiliary.
- Hence, the sentence becomes a fragment and does not complete the grammatical structure.

**Correct form (one acceptable correction):** "The supposedly transparent framework for public consultation **was paradoxically obscuring** the very issues it claimed to clarify."

**Grammatical rule used:** A complete sentence requires a subject and a finite verb. If an -ing form is used as part of the verb phrase, it must be supported by an auxiliary verb (is/was/are/were/has been/had been, etc.).

**Example of the rule:** Incorrect: "The policy **creating** confusion." Correct: "The policy **was creating** confusion."

**Information booster:** Participial phrases (-ing/-ed) can modify nouns, but if they are intended as the main action, a proper auxiliary or finite verb is compulsory.

So the correct answer is (c)

**Q.100** Convert the sentence provided below from its passive voice structure to an active voice structure:

The material had been being assembled for days before the launch.

- They were assembling the material for days before the launch.
- They had been assembling the material for days before the launch.
- They had assembled the material for days before the launch.
- They had been assembled the material for days before the launch.

**Answer:** B

**Sol:** The correct option is (b).

**Given (Passive):** "The material **had been being assembled** for days before the launch."

**Identify tense and structure:**

- "had been being assembled" is **Past Perfect Continuous Passive**.
- **Passive structure:** *Object + had been being + V3*
- **Active structure:** *Subject + had been + V1-ing + object*

**Conversion steps (Passive to Active):**

- Make the object "the material" the object again in active.
- Add a suitable subject like "they" (agent is not given, so a general subject is used).
- Convert "had been being assembled" to "had been assembling."
- Keep the time expression "for days before the launch" unchanged because it shows duration and time reference.

**Correct active sentence:** "They **had been assembling** the material for days before the launch."

**Why other options are incorrect:**

- (A) "were assembling" changes the tense to Past Continuous and loses the "had" (past perfect sense) and the long duration implication before another past event.
- (C) "had assembled" becomes Past Perfect Simple, which removes the continuous/duration meaning.
- (D) Grammatically incorrect: "had been assembled" is passive and also wrongly formed with the object placement.

So the correct answer is (b)